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'ROUND THE WORLD WITH COTTON

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SOUTHERN DIVISION

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FOREWORD

'ROUND THE WORLD WITH COTTON presents in simple, nontechnical style, a story of cotton at home and abroad. It uses easily understood words, photographs, charts, and pictographs to tell in entertaining fashion what has happened to cotton since its legendary origin in India 5,000 years ago.

Many more citizens of the United States depend upon cotton for a living than upon any other crop we grow. Despite cotton's importance, the vast fund of information that has accumulated about cotton is not readily available to the average person, nor to schools and colleges. A great deal of cotton's story lies buried in scientific words and statistics that discourage the reader.

This publication brings together under one cover much interesting information about cotton. It is designed to give the average reader a general understanding of cotton and to stimulate interest for additional facts on this important world commodity.

Many persons in and outside the Department of Agriculture have had a part in preparing 'ROUND THE WORLD WITH COTTON. In addition to this assistance, the manuscript was reviewed by a number of educational workers in the South and their suggestions have been of great value in determining the content and style.

HENRY A. WALLACE,
Secretary of Agriculture.

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PART ONE ..

the STORY *of*
COTTON



DO YOU KNOW: How many persons depend directly upon cotton for a living? Where these persons live? Why cotton provides employment for so large a number? In what ways it is important in our daily lives? How cotton ranks among the fibers used by our textile industry? What are some of the more important uses of cottonseed? How the number of cotton farms compares with those of other types? To what extent the South is dependent upon cotton? Why all the people of the United States are concerned with the welfare of those persons engaged in growing, handling, and processing this important crop?

IMPORTANCE OF COTTON

Cotton is the most important cash crop grown in the United States. There is no other agricultural commodity upon which so many American citizens depend for a living.

It is true that corn, wheat, and hay occupy a larger acreage, but corn and hay are feed crops consumed largely on the farms where they are produced, and wheat provides employment for relatively few people.

Approximately 13,500,000 people in the United States are directly dependent for at least a substantial part of their livelihood on the cotton crop. This is almost 11 percent of the population of continental United States.

On 2,000,000 cotton farms of the South and the Southwest there are more than 10,000,000 persons dependent on cotton for the greater part of their income. Cotton textile manufacturing in all its branches provides the support of approximately 3,000,000 citizens. In other work based upon cotton marketing and processing there are about 500,000—making a total of at least 13,500,000 persons directly dependent upon cotton for the necessities and comforts of life.

These figures, large as they are, do not include the many owners of stocks and bonds of cotton mills and other companies, the business of which is based on cotton, or the bankers who finance the growing, handling, and manufacturing of cotton and the merchandising of cotton products. Nor do they include the millions engaged in retail merchandising in establishments ranging from the crossroads trading center to the great city department store, each of which has a large variety of cotton products on its shelves.

Among the important farm crops grown in the United States, cotton is the only one that cannot be used until it is processed; therefore cotton is unique. This processing must be carried on in specialized plants away from the farm. This is in sharp contrast with the situation applying to corn and the small grains, which are in

usable form for feed on the farm. The cotton farm is the source of raw materials for a very long series of commercial processing operations unequalled in the case of any other important field crop.

COTTON USED IN A THOUSAND WAYS

The cotton crop of 12,399,000 bales harvested in the United States in 1936, including \$141,289,000 for seed, yielded a cash return of \$905,682,000 to the growers. This exceeded the value of any other

CASH FARM INCOME FROM COTTON, WHEAT, AND TOBACCO INCLUDING GOVERNMENT PAYMENTS—AVERAGE 1933-37

COTTON



WHEAT



TOBACCO



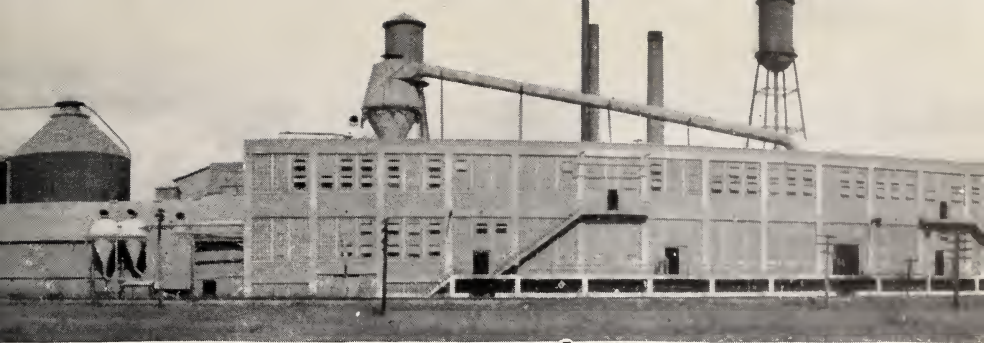
EACH BAG REPRESENTS 100,000,000 DOLLARS

crop grown in the United States except corn and exceeded the combined value of the wheat and tobacco crops of the country by over \$30,000,000.

Why is cotton so important? Cotton is important because it enters into the daily life of every person in the Nation. It is a necessity of the rich and poor alike. It is found in every home. It is used by dozens of America's most important industries.

Cotton is used in more than 1,000 ways.

Perhaps you have never thought of it, but there has probably never been a day in **YOUR LIFE** when you did not use cotton in several ways.



A cottonseed-oil mill

It makes no difference what you are doing—sleeping, dressing, eating, reading, working, riding in an automobile, going to school, or enjoying some form of recreation—cotton probably enters into the activity.

AN ALADDIN'S LAMP

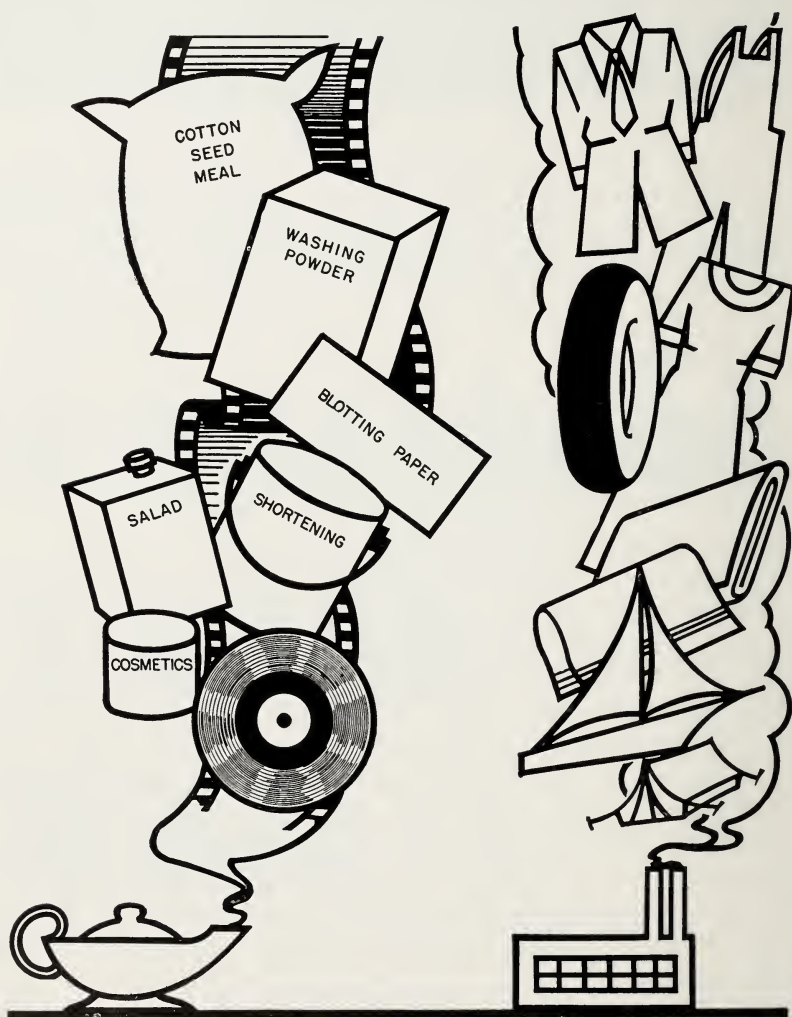
Have you ever thought about all the things that may happen to a load of seed cotton as it comes from the fields of our Southern farms? Have you ever considered how far a load of seed cotton may travel? Do you realize how it affects **YOU AND YOUR NEIGHBORS**—and even persons who live in far-away lands?

Out of the seed, which makes up approximately 65 percent of the cotton by weight, you may have a dressing for your salad, or perhaps you may have some shortening to use in the preparation of your foods. You may even have a spread for your bread. The paper on which you write letters to your friends may be made from linters—the little fibers that cling to the seed as it comes from the gin. Cotton linters help make possible your entertainment when you go to the picture show, for the action reflected on the silver screen is recorded on one of the many products of cotton. Cottonseed products are used in the making of smokeless powder, house paint and varnish, cattle feed, fertilizer, washing powder, cosmetics, hats, phonograph records, oilcloth and linoleum, and a very long list of other useful articles.

“Cottonseed,” according to a statement issued by the National Cottonseed Products Association, “is a veritable Aladdin’s lamp whose depths magically yield hundreds of the necessities so essential to our comfort and well-being.”

Did you realize how greatly we are indebted to cottonseed for the many things that contribute to our comfort and happiness? Now let us turn our attention to the fiber, which is sometimes called “white gold.”

SOME USES OF COTTONSEED AND LINT



WEIGHT OF SEED (PERCENT)

WEIGHT OF LINT (PERCENT)



WORLD FIBER CONSUMPTION 1933-37

COTTON 56.4 %



JUTE 15%



WOOL 7.7%



FLAX 7.1%



HARD FIBERS * 5%



RAYON 4.9%



HEMP 3.4%



SILK - LESS THAN ONE-FOURTH OF A SYMBOL .5%



EACH SYMBOL REPRESENTS 4 PERCENT OF TOTAL CONSUMPTION OF ALL FIBERS

* ABACÁ, CANTÁLA, HENEQUÉN, ISTLE, PHORMIUM, SISAL, ETC.

MOST IMPORTANT FIBER

Of all the fibers used in the world, cotton is the most important.

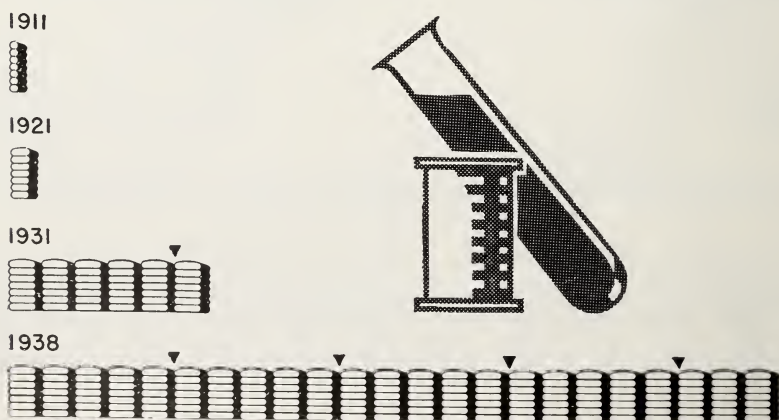
Wool and silk are older than cotton in the world of commerce with which America has had contacts. These fibers were used in the making of textiles before cotton was available. But when cotton began to be grown in sufficient quantity to have commercial possibilities it attracted the attention of manufacturers and also the buying public. This did not please the makers of wool and silk cloth; they fought the use of cotton in every possible way.

Have you, for example, ever heard of the Calico Act? It was passed in England many years ago and prohibited the printing of cotton cloth and the wearing of such material. For failure to abide by the provisions of the act heavy fines were imposed upon both buyers and sellers.

It was as late as 1831 that all laws restricting calico-printing were repealed. The silk weavers of Spitalfield, a district of London, were largely responsible for the passage of the Calico Act. They were opposed to any effort designed to make cotton cloth attractive because it would compete with their industry. But it was impossible for the makers of silk and wool materials to impede the growing popularity of the newer fabric; the demand for cotton cloth continued to increase.

In the period 1933-37 cotton supplied 56 percent by weight of all fibers used in the world; jute, 15 percent. The remaining 29 percent included wool, flax, rayon and rayon staple fiber, hemp, and silk.

WORLD PRODUCTION OF RAYON IN TERMS OF COTTON



EACH SYMBOL REPRESENTS THE EQUIVALENT OF 200,000 BALES OF COTTON COMPUTED ON BASIS OF 425 POUNDS OF RAYON TO EACH 500 POUNDS, GROSS WEIGHT, OF COTTON (BOTH RAYON AND STAPLE FIBER INCLUDED)

Cotton, jute, wool, hemp, flax, hard fibers, and silk are agricultural products. Rayon yarn and rayon staple fiber are synthetic fibers. They are made in factories from materials containing what is called cellulose, which is usually obtained from wood pulp or cotton linters. Rayon represents a comparatively recent contribution to the science of manufacturing. It is significant that these synthetic fibers are increasing in use. In 1938, for example, almost 16 times as much rayon was used as silk. The total rayon consumption is almost 15 percent of the cotton now used in the world.

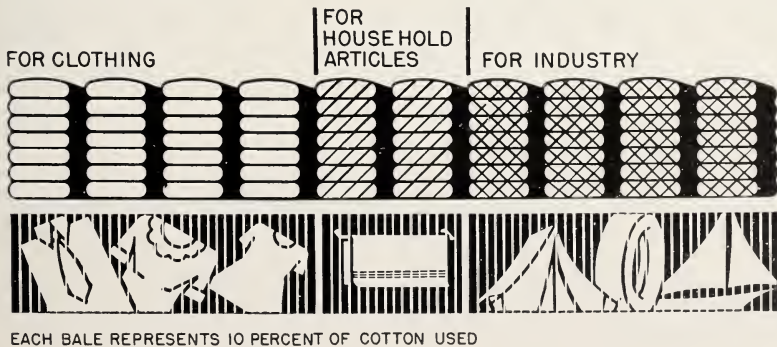
In some important cotton-consuming countries, including Japan, Germany, and Italy, the government has issued decrees requiring manufacturers to mix rayon staple fiber with cotton and wool. Rayon sells for a higher price per pound than raw cotton, but it is cheaper than wool or silk.

COTTON CONSUMPTION

For the past quarter of a century the annual consumption of lint cotton for each citizen of the United States has been approximately 26 pounds. This includes the quantity used by every man, woman, and child. Within this period of time, the average annual per capita consumption has varied from a little less than 20 to a little more than 30 pounds. The mill consumption varies with general economic conditions. When times are good, buying increases; when they are bad, purchases are deferred.

Clothing accounts for about 40 percent of the cotton consumption of the United States. Much of this large quantity goes into work clothing including uniforms, shirts, overalls, house dresses, and aprons. But cotton also provides sheer and attractive materials for afternoon and evening dresses, sports wearing apparel, and children's clothing.

USES OF LINT COTTON IN THE UNITED STATES



In the household, cotton is used extensively in bedding, towels, curtains, furniture covers, and for many other purposes. Cotton used in the household accounts for about one-fifth of the total consumption in the United States.

The remaining two-fifths of our domestic consumption goes into the so-called industrial uses of cotton. The most important of these are associated with the automobile industry. Bags for packaging flour, feed, sugar, and various other commodities also constitute an important industrial use for cotton. Then there are many other cotton products such as belts, hose, and twine.

Although cotton has a multitude of uses, the discovery of new ones for this important product promotes the welfare of the Nation. So many persons are dependent upon cotton for a living that unless cotton is consumed in vast quantity these persons do not have a satisfactory income. This applies both to those who grow and those who process the crop. The South has a larger number of these workers—both farmers and wage earners in the cotton textile industry—than any other section of the country.

THE NATION'S COTTON FARMS

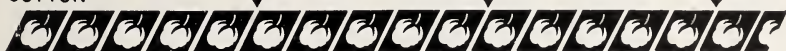
In 1930 there were in the United States 6,289,000 farms. Of this number, 1,640,000 were of the cotton type. This means that on these farms—which represented a larger number than any other type—40 percent or more of the value of all products of the farm was derived from the sale of cotton and cottonseed. As a matter of fact, on many of these farms there was no cash income except that realized from the sale of cotton—lint and seed.

The fact that the census of the United States reveals that there were 1,640,000 cotton-type farms in 1930 does not mean that cotton was grown only on these farms. As a matter of record, the census reports that cotton was grown on 1,989,000 farms that year. The difference is explained by saying that on about 350,000 farms where cotton was grown, it was the source of less than 40 percent of the cash income. Cotton, it will be noted, is grown on about one-third of the farms of the Nation, and for four-fifths of those on which cotton is grown it is the major source of cash income.

Most of the cotton grown in the United States is produced in 10 Southern States. These States are Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. In addition, cotton is grown in Arizona, California, Florida, Illinois, Kansas, Kentucky, Missouri, New Mexico, and Virginia.

TYPES OF FARMS IN THE UNITED STATES 1930

COTTON



GENERAL



DAIRY



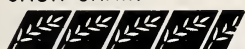
SELF-SUFFICIENCY



ANIMAL-SPECIALTY



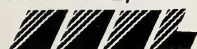
CASH-GRAIN



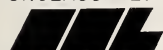
CROP-SPECIALTY



PART-TIME, AND OTHERS



UNCLASSIFIED



POULTRY



FRUIT



TRUCK



STOCK-RANCH



EACH SYMBOL REPRESENTS 100,000 FARMS

COTTON FARMS IN MAJOR COTTON-PRODUCING STATES 1934

TEXAS
(73% OF
ALL FARMS)



MISSISSIPPI
(86% OF
ALL FARMS)



ALABAMA
(85% OF
ALL FARMS)



GEORGIA
(80% OF
ALL FARMS)



ARKANSAS
(73% OF
ALL FARMS)



NORTH
CAROLINA
(47% OF
ALL FARMS)



SOUTH
CAROLINA
(81% OF
ALL FARMS)



OKLAHOMA
(59% OF
ALL FARMS)



LOUISIANA
(74% OF
ALL FARMS)



TENNESSEE
(33% OF
ALL FARMS)

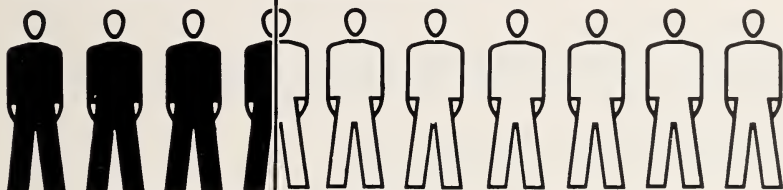


EACH SYMBOL REPRESENTS 50,000 COTTON FARMS

PERSONS LIVING ON FARMS IN THE UNITED STATES 1935

ON COTTON-
GROWING FARMS

ON OTHER FARMS



EACH PERSON REPRESENTS 10 PERCENT OF ALL FARM PEOPLE

More than 10,000,000 persons live on the cotton-growing farms of the United States. This is approximately one-third the farm population of the Nation, for in 1935 there were about 32,000,000 persons living on farms in the 48 States of the Nation.

TEXTILE MILLS

But what about the textile industry? What place does it occupy in American industry? How many persons are employed in this phase of manufacturing in the Southern States?

From the standpoint of the number employed, the textile industry is the most important branch of industry in the Nation. It is the leading manufacturing industry in the South.

In the Southern States there are almost 500,000 wage earners employed in the textile industry. The value of textile products manufactured in the South, in normal years, reaches a total of about \$1,000,000,000.

On the average each year the cottonseed industry sells about \$180,000,000 worth of manufactured products. For the most part, this industry is carried on in the States in which cotton is grown.

COTTON AND THE NATION'S WELFARE

Since approximately 13,500,000 persons are directly dependent on cotton for a living, the crop is one of economic importance to the Nation. When the 10,000,000 persons on cotton farms get a good income from their crop, they spend the money for the commodities and services produced by the workers in other occupations living in all parts of the country. They can buy clothing, farm implements, building materials, automobiles, and all the commodities which persons engaged in other industries make for sale. They are also able to buy

WAGE EARNERS OF THE TEXTILE INDUSTRY IN THE SOUTH 1935

NORTH CAROLINA



SOUTH CAROLINA



GEORGIA



ALABAMA



TENNESSEE



VIRGINIA



TEXAS



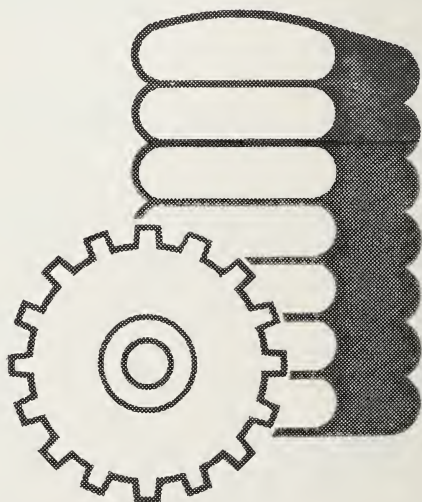
KENTUCKY



MISSISSIPPI



LOUISIANA



ARKANSAS, FLORIDA AND OKLAHOMA - LESS THAN 1,000 EMPLOYEES EACH

EACH SYMBOL REPRESENTS 5,000 EMPLOYEES

VALUE OF TEXTILES MANUFACTURED IN THE SOUTH 1935

NORTH CAROLINA



SOUTH CAROLINA



GEORGIA



ALABAMA



TENNESSEE



VIRGINIA



TEXAS



KENTUCKY



LOUISIANA



MISSISSIPPI



VALUE OF PRODUCTS IN ARKANSAS, FLORIDA AND OKLAHOMA—
LESS THAN 2,000,000 DOLLARS EACH

EACH BILL REPRESENTS 10,000,000 DOLLARS



personal and professional services. But when the income from cotton is low, purchases by cotton producers are limited to the barest necessities. The same thing is true of workers in the textile industry. When the demand for cotton products makes it possible for them to work full time, they have money to buy the commodities produced by farmers and industrial workers. But when working only part time, they have little money to spend.

Thus the welfare of the people of the Nation, regardless of where they live or what they do, is determined in some measure by what happens to cotton.

A ROYAL PLANT

The cotton crop of America concerns not only our own citizens, but to some extent all the people of the world. When the cotton of America was sold to foreign countries to a greater extent than it is today, Henry W. Grady, an eminent Georgia newspaper editor, made the following statement concerning the importance of cotton :

Not the fleeces that Jason sought can rival the richness of this plant, as it unfurls its banners in our fields. It is gold from the instant it puts forth its tiny shoot. The shower that whispers to it is heard around the world. The trespass of a worm on its green leaf means more to England than the advance of the Russians on her Asiatic outposts . . .

The uttermost missionary woos the heathen with a cotton shirt in one hand and a Bible in the other, and no savage, I believe, has ever been converted to one without adopting the other . . . And it peeps from the satchel of every business and religious evangelist that trots the globe . . .

The Dominion of our king is established, this princely revenue assured, not for a year, but for all time. It is the heritage that God gave us when He arched our skies, established our mountains, girt us about with the ocean, tempered the sunshine, and measured the rain—ours and our children's forever.

This statement depicts what might be termed the "Golden Age" of cotton but the crop is still of major importance to the citizens of the United States and the people of all cotton-consuming countries of the world.

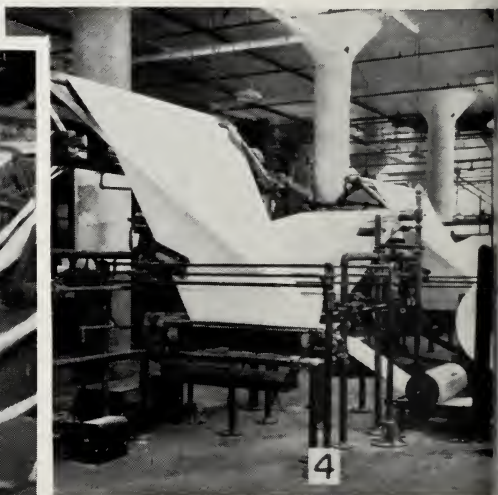
SUMMARY

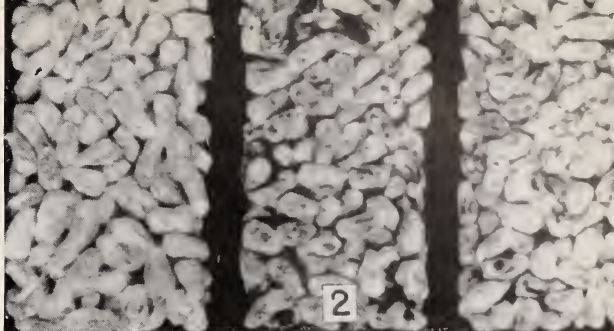
1. There are about 13,500,000 persons in our country who depend directly on cotton for a living. This is about 11 percent of the population of continental United States.
2. Ten million persons, or about one-third of our total farm population, live on farms where cotton is grown.
3. There are more cotton farms than those of any other type—that is, farms deriving 40 percent or more of their income from cotton.
4. Cotton is our most important fiber, and represents 56 percent of all the fiber in the entire world.
5. Sixty percent of the fiber of the cotton plant is used for clothing and household uses; 40 percent is used in industry.
6. The textile industry employs more workers in the South than any other branch or division of manufacturing.
7. The cotton crop often brings the producers almost \$1,000,000,000. Annually the value of the products of southern textile mills is \$1,000,000,000. The annual value of the products sold by the cottonseed industry is about \$180,000,000.
8. The prosperity of the entire Nation is affected by the price of cotton and the market for the products of the textile industry.



Cotton and Some Industrial Processes

1. A cotton field.
 2. A cotton mill.
 3. } Interior of a cotton mill.
 4. }
 5. A building partially made of cotton (experimental).
 6. Roads reinforced with cotton (experimental).
-





Cotton Lint and Seed

1. American cotton at Liverpool.
2. Cottonseed.
3. Cotton bags.
4. Feeding cottonseed meal.
5. A juicy steak.

DO YOU KNOW: In what parts of the world cotton was first found? How long cotton has been used for making cloth? To what extent cotton was known by the ancient peoples? How long cotton has been grown in America? When cotton became a crop of commercial importance? Why the South turned to cotton growing? Where the first cotton of commercial importance grown in the South was used? When a textile industry was established in the United States? How the textile development of the South compares with that of the Northeast?

HISTORY OF COTTON

If we could fly backward on the Magic Carpet of Time to the city of Babylon in the days of King Nebuchadnezzar, many strange sights would greet our eyes.

On a sight-seeing tour we would want to see the hanging gardens and other unusual marvels of this rich and noted metropolis about which we have read in history.

But in ancient Babylon nothing that we might see would be so economically significant as the stocks of rare merchandise offered for sale by the traders.

Perhaps there would be jewels; exquisite pieces of handicraft would catch our attention; and there would be beautiful, delicate, fascinating pieces of cloth the like of which the world had never seen. It is this cloth with which we are concerned.

Where did these matchless pieces of cloth come from? By whom were they made? How was the art acquired? Alas, the Babylonians did not know. Traders were asked the question: "Where did you get this cloth?" An answer might have been: "By traveling far to the east and suffering many hardships, I discovered a trader who possessed these treasures. And from him I secured these fabrics for your pleasure and enjoyment."

Such a reply might have been truthful, but it was an unsatisfactory one. One trader, it seems dealt with so many others in the buying and selling of rare goods that their origin was lost in obscurity.

Writers describe the cloth purchased in ancient India as being "so fine you could hardly feel it in your hand . . . When muslin is laid on the grass to bleach and dew has fallen on it, it is no longer discernible."

Is it any wonder that poetic authors of the Orient spoke of these fine fabrics as "webs of woven wind"?

Although it is not known exactly where the treasured fabrics of the ancient traders were first made, it is more than likely that they came from India.

India has always been a country of mystery. But we know that reference is made to cotton cloth as early as 1500 B. C. In fact, from 1500 B. C. until an equal number of years after the beginning of the Christian Era, India was the center of the cotton industry. So it may be concluded that India is one of the earliest homes of cotton and cotton cloth. The fine fabrics that found their way to the markets of the ancient world were, of course, hand-made. They represented months and perhaps years of painstaking labor. For 3,000 years India had no rival in the making of cotton cloth.

ORIGIN OF COTTON

The origin of cotton is shrouded in obscurity. There is no authentic history of early cotton culture, but there are many legends.

One of these remarkable legends is recounted by Henry Lee in his book, *The Vegetable Lamb of Tartary*.

It seems, according to Lee, that when persons asked the source of the materials out of which the fine cloth was made, they were told a story something like this:

The fiber used in the making of the cloth comes from a vegetable-lamb, which is part plant and part animal. It comes from a seed like that of a melon. When the seed is planted, it grows into a beautiful plant, and when the fruit of the tree is fully ripe, it bursts open and discloses a little lamb, perfect in form, and in every way resembling an ordinary lamb naturally born. The wool is gathered from the lamb and cloth is made.



The "Vegetable lamb"

There are many variations of this legend. Another, slightly different, is as follows:

The fiber comes from a very unusual plant. When the plant matures, a little lamb—a living animal—becomes attached to the stalks. The stalks are very flexible so the little lamb may bend them to the earth as it eats the nearby vegetation. When the lamb has consumed all the food within reach of the plant, it dies.

If these legends seem absurd, they can—in a measure—be explained by the fact that cloth was made from wool, insofar as it is known, long before any other materials were used. So if this was true in India, it is logical that the people would have thought of other fiber as being related to sheep and wool.

COTTON IN ANCIENT CHINA

From India cotton culture and cloth-making seem to have spread to Persia and China. The Chinese were not so quick to adopt cotton cloth, for China was the country of silk. Vested interests in China for a long time barred the way against the adoption of cotton. It is reported that a Chinese emperor born in 502 B. C. had a cotton robe presented to him as a gift. But it was not until 1,500 years later that cotton began to be cultivated in China for manufacturing purposes.

The cotton plant was first grown in the garden of Peking for its flowers.

COTTON IN THE OLD AND IN THE NEW WORLD

The history of cotton culture and the making of cotton cloth in India are very significant in relation to the history of cotton in our own country.

INCREASED COTTON PRODUCTION IN THE UNITED STATES FOLLOWING THE INVENTION OF THE COTTON GIN

1790



1793 (GIN INVENTED)



1796



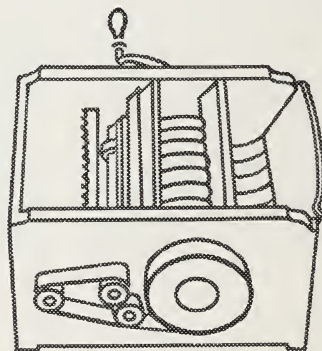
1799



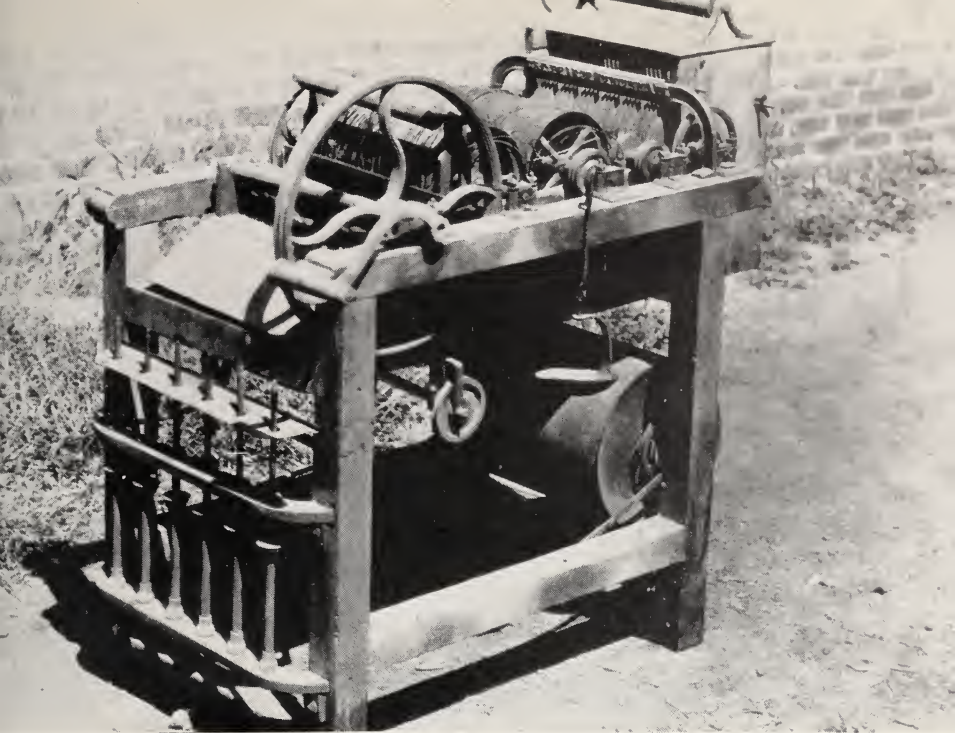
1802



1805



EACH SYMBOL REPRESENTS 6,000 BALES OF COTTON



The Columbian Spinster

It is known, of course, that the merchants of the Old World wanted to trade with the people living in India and the countries of the Far East. It was to find some way of reaching the treasures held by these people that exploration was given such emphasis in the fifteenth century. Finally, and most important to us, all this effort culminated in the voyage of Columbus and the discovery of America.

In a way, it may be said that America was discovered in the effort to provide—among other things—cotton cloth to the people of the other nations of the world. America has not failed those who sought cotton, because for many generations it supplied most of the cotton required to clothe the world.

COTTON IN THE WESTERN HEMISPHERE

When Columbus came to America, he found cotton growing in the West Indies. Cortez, who made the conquest of Mexico, found the natives there highly skilled in weaving, spinning, and dyeing cotton. Pizarro, the Spaniard who invaded Peru in 1522, found the natives clad in cotton garments. He also found mummies wrapped in cotton cloth.

The ancient cliff dwellers in our Southwest made coarse cloth from cotton. Some cotton cloth, of unknown origin, was found in Utah.

It is thought by some authorities that the culture and use of cotton were well advanced in the New World centuries before its discovery by Europeans.

COTTON IN THE UNITED STATES

Cotton was planted by the English colonists almost as soon as they were established in the New World. Tobacco, rice, and indigo were very profitable crops, however, and for a time were more popular than cotton. But England wanted cotton, and this demand by the Mother Country perhaps more than any other cause turned the people of the South to the growing of cotton. Had this demand for cotton not come when it did, the whole history of the United States, and especially that of the South, might have been very different. The South might, for example, have been an industrial rather than an agricultural section. Had such a development taken place, the whole social, economic, and political outlook of the people would have been different from that associated with an agricultural country producing raw materials for export.

INDUSTRIAL REVOLUTION

Beginning about 1760 there started in England what we have come to know as the Industrial Revolution. This was the beginning of the factory methods that we hear discussed so frequently today.

During the last half of the eighteenth century in England many new machines for the making of cloth were invented. To use these machines, it was more profitable to establish them in large units. Thus the factory system of industry was launched. Formerly, manufacturing had been done by hand in the homes of the workers.

The textile industry in England developed around the use of wool and silk. But the progressive men engaged in the management of the new machines in the factories saw the possibilities of greatly expanding the industry through the use of cotton, which would supply a cheaper raw material.

Naturally, England turned to the Colonies in America as the source of this raw material.

DESTINY OF A PEOPLE

In 1790, the cotton crop of the United States was about 3,000 bales. This was such a small quantity that it seems insignificant today, when the crop of our Nation is calculated in terms of millions of bales.

A few years later the most important event in the economic history of the South took place. A young man from the North, Eli Whitney,

came to Georgia to serve as a tutor in the family of Mrs. Nathaniel Greene at Mulberry Grove, a plantation near Savannah. He saw the Negroes laboriously separating the lint from the cottonseed. It was as you may imagine, a very slow process; a day's work for one laborer often produced only 1 pound of cotton.

Eli Whitney saw the need for a machine with which to do this work. He invented the cotton gin to meet this very definite need. The patent on this invention was granted in 1794.

The cotton crop of the United States reached a total of 100,000 bales just 8 years after the gin was invented.

England, as a result, obtained the cotton required to supply its growing textile industry, and the South found a cash crop for which there was a ready and growing market. In this way, the cotton economy of the South was established.

About this time (1800-15) the South was as much interested in manufacturing as in farming. A number of small plants had been established, and the South was perhaps thought of as the dominant section in the industrial life of the Nation. England just then was willing to pay a good price for cotton, however; so the South turned to cotton growing as the easiest way to make money. New lands were cleared; slaves were bought; and great expanses of cotton fields became the most outstanding characteristic of the southern landscape. The South became less interested in manufacturing; many small plants were closed. Soon, of course, there followed the industrial expansion in the North.

The destiny of a people in the New World was determined because the newly created factories of Great Britain wanted cotton.

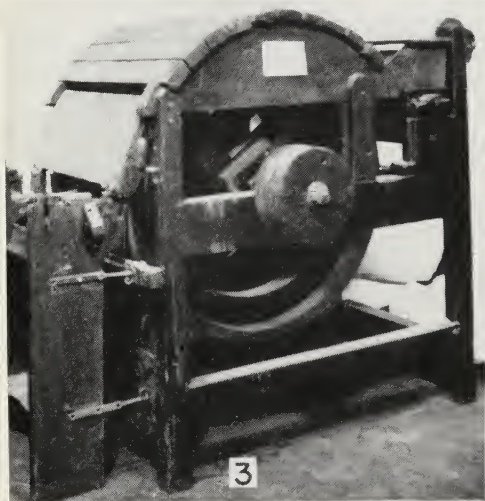
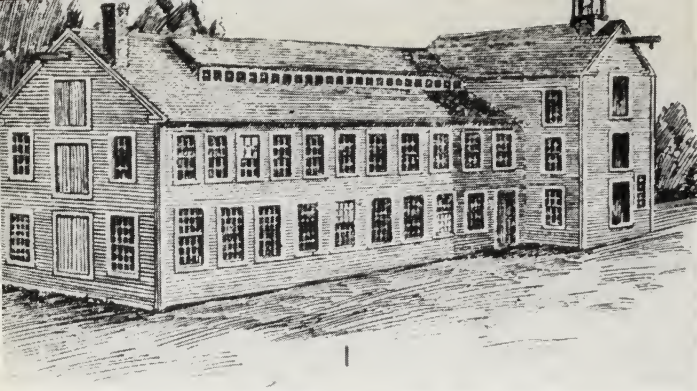
By 1858, cotton had become so important that James Henry Hammond, a Senator from South Carolina, stood in the Senate Chamber and said, "You dare not make war on cotton. No power on earth dares to make war on it. COTTON IS KING."

TEXTILE INDUSTRY IN AMERICA

Naturally, the citizens of the United States were greatly interested in the growing textile industry of England. Many wished that such a source of employment and profit might be available to Americans. But machinery for manufacturing plants was new and we did not have in this country the trained engineers for designing and making it, which were available later.

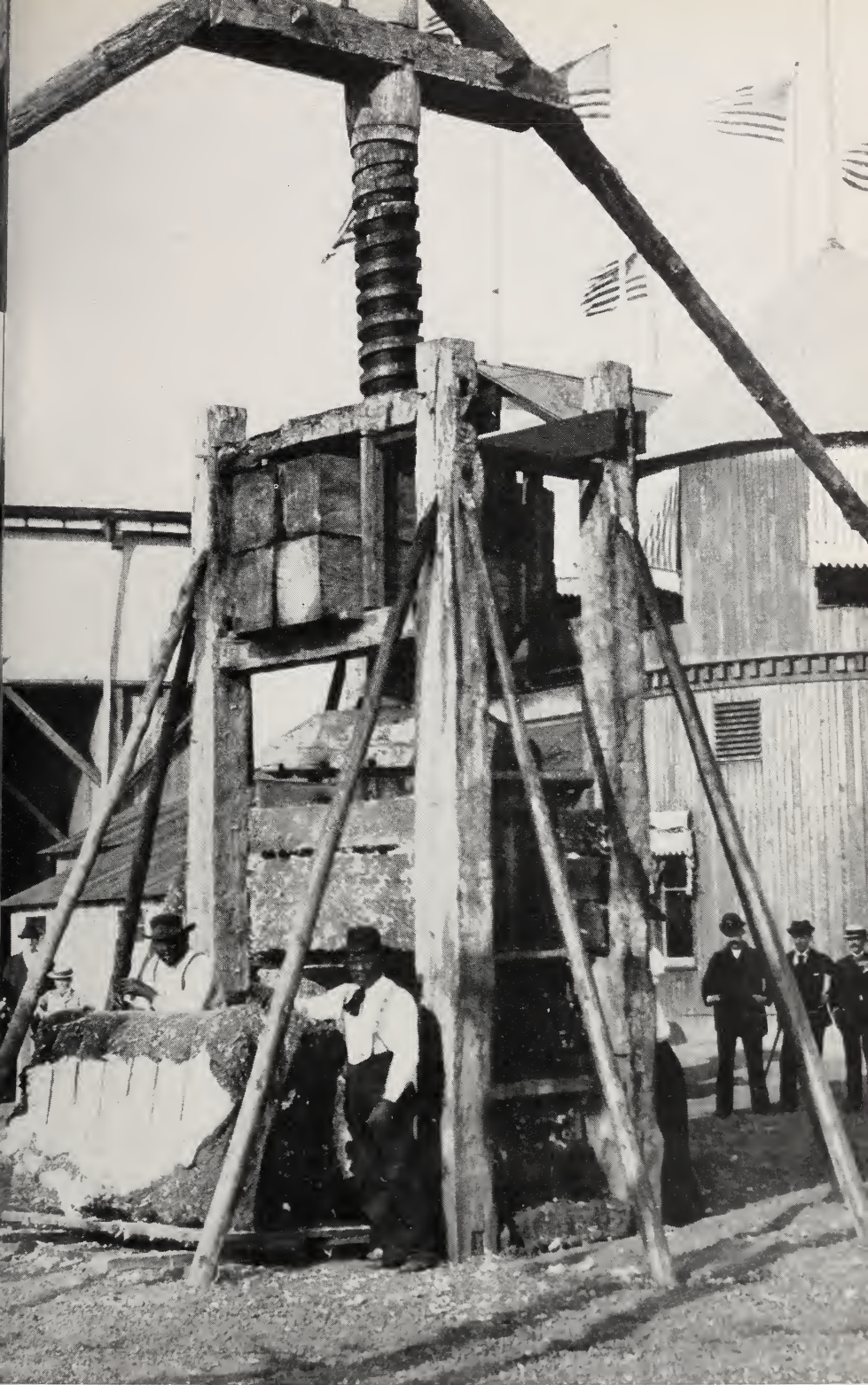
The English inventions of textile machinery were guarded in every possible manner. No drawings of the machines were permitted. No worker was allowed to tell how they were operated.

But Samuel Slater, known as the "father of the textile industry in America," landed in this country in November 1789. He had served



Beginning of the Cotton Industry

- | | | |
|------------------|-----------------------------|--------------------------------------|
| 1. Slater's mill | 3. Slater's carding machine | 5. Eli Whitney |
| 2. Samuel Slater | 4. First cotton gin | 6. Bale press in a modern cotton gin |



An Early Screw Press for Baling Cotton

as an apprentice under Arkwright, an English inventor. With him there was brought to the New World a working knowledge of the textile machinery of Great Britain.

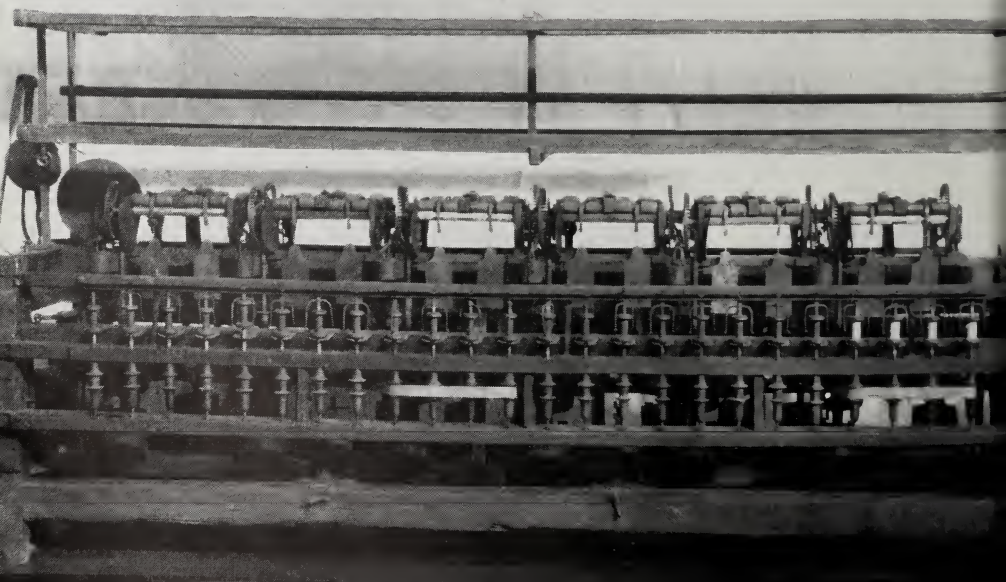
Samuel Slater built the first cotton-spinning machinery in America. In 1790, he erected the first cotton mill in this country at Pawtucket, R. I. Part of the machinery that was used in this mill, which marked the establishment of one of our greatest industries, is still in existence, preserved in the United States National Museum.

Other textile-mill developments soon followed the initial effort of Samuel Slater.

Nathan Appleton, Francis C. Lowell, and Francis S. Jackson, in 1813, were among the sponsors for the building of the first power loom in America at Waltham, Mass. The machinery for this mill was constructed by Paul Moody. The first steam-operated mill was established at Salem, Mass., in 1847. In this manner, a textile industry rivaling that of Great Britain had its beginning in the United States.

By 1840, there were only 180,927 active spindles in the cotton-growing States, while there were 1,597,394 in the New England States. For many years there was a steady increase in cotton mills until the peak was reached in 1921 in the New England States with 18,387,789 active spindles. During this long period the South was developing its textile industry steadily, but its 15,708,988 active spindles in 1921 did not quite equal the number in the Northeast. Between 1921 and 1937, the South continued its steady growth reach-

A cotton spinning frame



ing a peak of 18,585,878 active spindles in 1930. Meantime the Northeast had suffered a sharp decline and by 1938 her active spindles had fallen to 5,918,686, or a little more than one-third of the earlier peak. In 1938, there were 18,126,112 active spindles in the cotton mills located in the South.

The making of cotton goods is the leading industry of the South today. The economic welfare of the South is largely dependent upon cotton, for the Southern States are concerned not only with the growing but also the processing of this important crop.

SUMMARY

1. India was one of the first homes of the cotton plant. Cotton fiber was grown and spun into fine cloth in that country many centuries ago. Therefore, it seems to have been the pioneer country in the cotton hand-spinning industry.
2. America, in a way, owes its discovery to the desire of the people of Europe to secure more easily the treasures of the Far East, including cotton cloth.
3. Columbus found cotton in the West Indies. Cotton has been grown in America for many centuries.
4. Cotton was planted by the English colonists very early in this country's history.
5. The development of cotton as a commercial crop waited upon the invention of the cotton gin.
6. We began to grow cotton more extensively in this country in response to a demand from England for cotton to be used in the growing textile industry of that country.
7. Prices for cotton were so favorable that the South lost its interest in manufacturing. This explains, at least in part, why the South developed so largely as an agricultural section, rather than as a section in which there was a more equitable balance between agriculture and industry.
8. Samuel Slater was the father of the textile industry in America. The first textile mills in the United States were erected in the New England States.
9. The South now has a larger number of active cotton spindles than the Northeast.
10. The South grows the cotton produced in this country, and it is also the center of the Nation's textile industry. The Southern States are largely dependent upon cotton to provide an income for the farmers of that section and employment for many wage earners in industry.

DO YOU KNOW: What conditions of climate seem to be necessary for the growth of the cotton plant? How much cotton is produced in the world each year? How the production of today compares with that of 10 or 20 years ago? In what countries cotton is grown? What are the most important cotton-producing countries? What change has recently taken place in the position of the United States as a cotton-growing country? To what degree the consumption of cotton has kept pace with production?

WORLD'S COTTON CROP

Cotton plants have been found growing wild in the tropical and warm temperate zones of both Northern and Southern Hemispheres. This means, of course, that cotton is a warm-weather crop.

In more than 60 countries of the world, some cotton is produced. But all of these countries have one characteristic in common—hot summers.

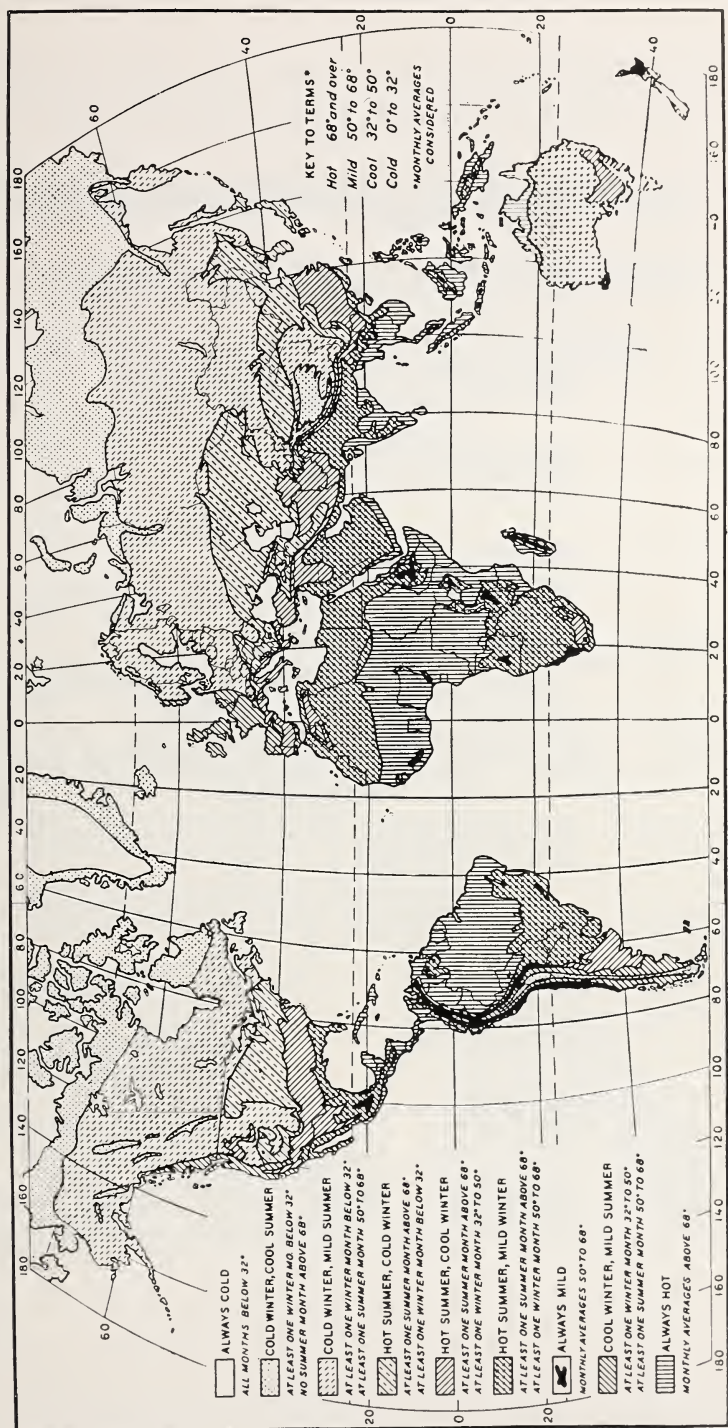
The Cotton Belt of the United States might be described as a region of hot summers and mild winters. In Mexico, for example, at Vera Cruz, where the temperature never falls below 70° F., cotton is grown in a climate that might be thought of as always hot. And in parts of the Union of Soviet Socialist Republics, where the winters are more severe than in the Corn Belt of our own Nation, cotton is grown in a climate of hot summers and cold winters.

The essential temperature requirement of cotton is a growing season of approximately 200 days. This means a period of about 6½ months between the last killing frost of the spring and the first in the fall. During this period between the time of planting and the date the fiber is ready for harvesting, the most favorable growth takes place when the days are continuously warm and there is an abundance of sunshine.

When the price of cotton is favorable, or when there are other factors that seem to make its production desirable, the regions in which cotton is grown are extended into territory with shorter summer seasons than those in which cotton is normally grown. In the United States, for example, cotton production has, at times, been extended beyond the confines of what is normally considered the Cotton Belt. In the Union of Soviet Socialist Republics, cotton is grown in the latitude of Chicago. But such climatic conditions found outside the belt from 40° north to 30° south latitude are not generally favorable to cotton production.

While it is true that the cotton belt of the world is restricted, it is most interesting to note that there is scarcely a month in the year

TEMPERATURE REGIONS—A REFINEMENT OF HERBERTSON'S THERMAL REGIONS

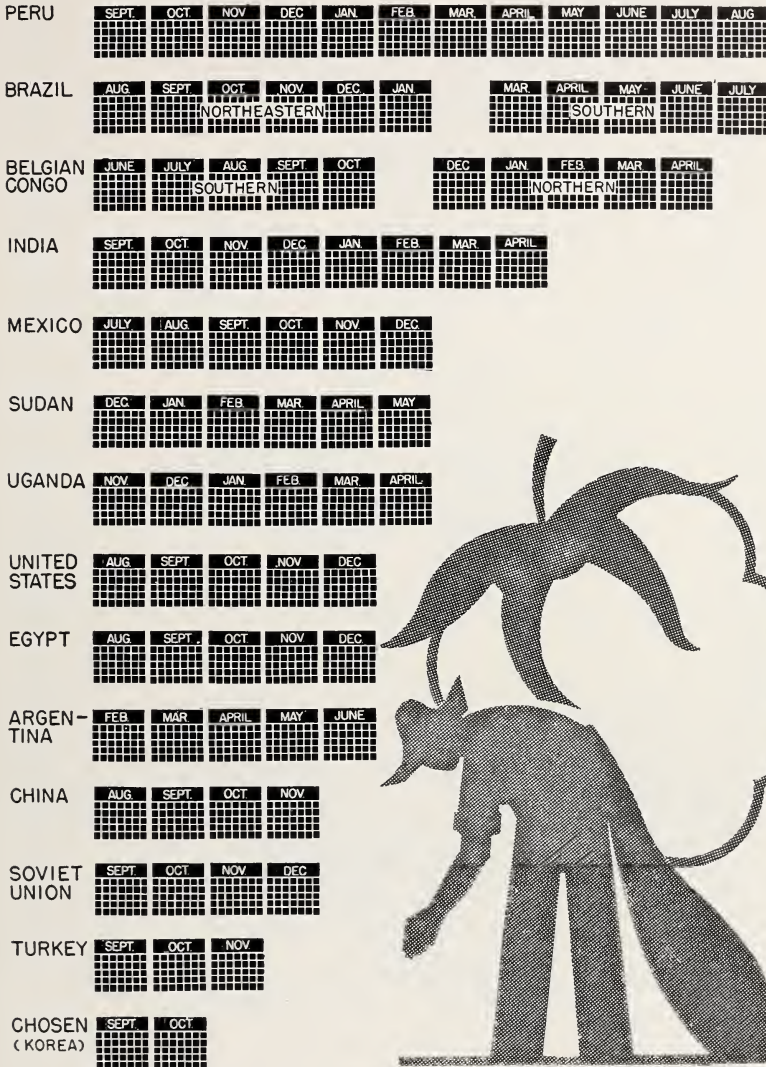


COTTON-PLANTING TIME IN SPECIFIED COTTON-PRODUCING COUNTRIES

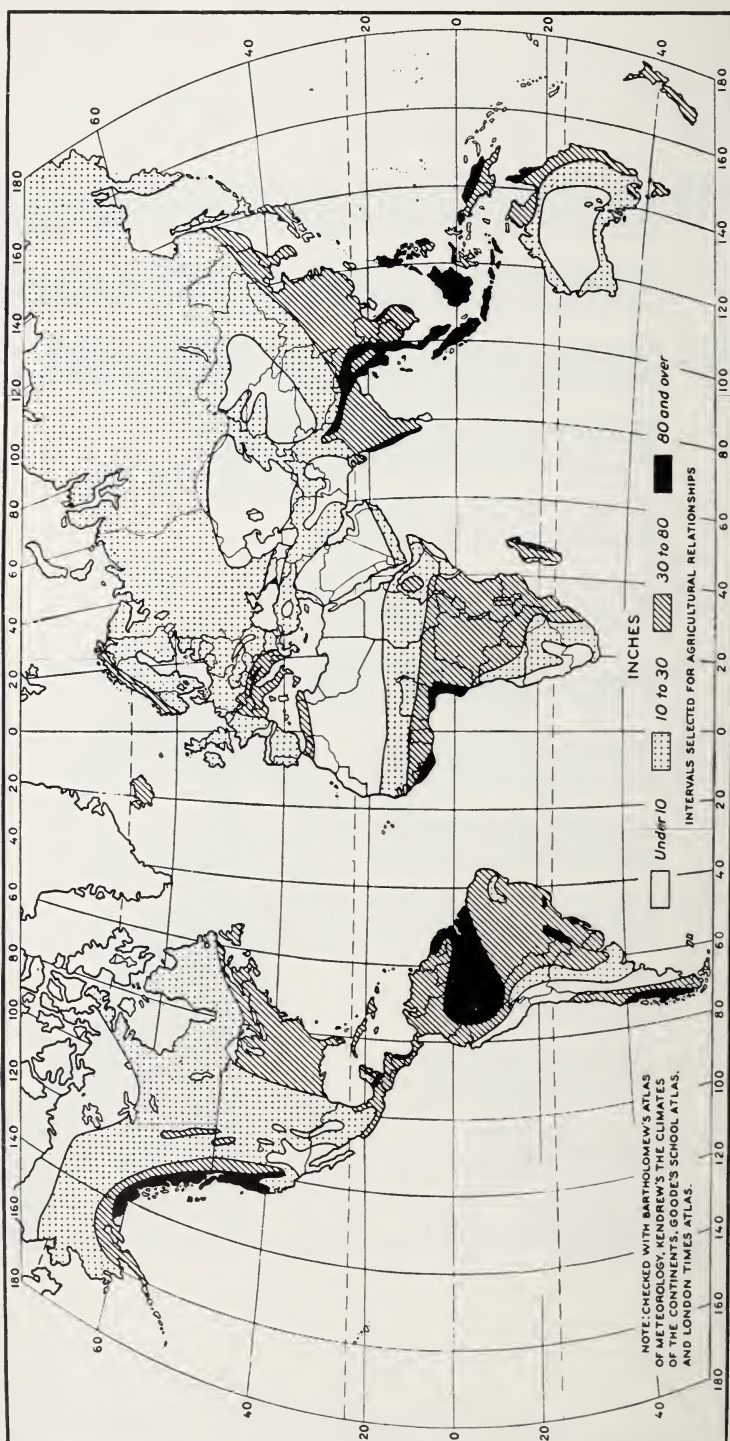
PERU	DEC	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT
BRAZIL	JAN	FEB	MAR	APRIL	MAY		SEPT	OCT	NOV		
			NORTHEASTERN					SOUTHERN			
INDIA	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT			
SUDAN	MAY	JUNE	JULY	AUG	SEPT						
UGANDA	MAY	JUNE	JULY	AUG	SEPT						
BELGIAN CONGO	DEC	JAN			JUNE	JULY					
					SOUTHERN	NORTHERN					
MEXICO & EGYPT	FEB	MAR	APRIL	MAY							
UNITED STATES	MAR	APRIL	MAY	JUNE							
CHINA & SOVIET UNION	APRIL	MAY	JUNE								
ARGENTINA	SEPT	OCT	NOV								
TURKEY	MAR	APRIL									
CHOSEN (KOREA)	APRIL	MAY									



COTTON-PICKING TIME IN SPECIFIED COTTON-PRODUCING COUNTRIES



ANNUAL RAINFALL



when cotton is not being planted in some countries and harvested in others. In the United States our cotton crop is planted for the most part in the months of March, April, and May. During the same months cotton is being picked in several countries of Africa, including the Belgian Congo, Uganda, and the Anglo-Egyptian Sudan. When we are harvesting our crop in the fall, cotton is being planted in India. During the autumn months when the farmers of North-eastern Brazil are harvesting their crop, the growers in southern Brazil are planting seed. Thus, in some country on the earth's surface a crop of cotton is being harvested every month in the year, and in some other country in every month a crop is being planted.

WATER AND SOIL REQUIREMENTS

Within the limits of favorable temperature conditions, the possibilities of cotton production are further restricted by water supply. Most of the cotton of the world is grown in humid regions which have a fair amount of rainfall in the summer.

Desert or arid regions are used for the production of cotton only where it is practicable to irrigate the land. Cotton can be grown on lands without irrigation with only about 20 inches of annual rainfall, or 7 or 8 inches of rainfall distributed over the growing season. Cotton is one of the most drought-resistant crops grown in the United States. If a cotton crop is well established, it will withstand long periods of scant rainfall, and then, when the rains come, growth and development will be resumed. Cotton is usually irrigated if grown in regions of winter rains and summer drought. Lands with heavy rainfall throughout the year are not well adapted to cotton culture, because a dry season is needed for proper maturing and harvesting.

Cotton growing is limited, then, to those parts of warm land that have (1) moderate rain at all seasons, (2) summer rain and winter drought, or (3) little or no summer rain but possibilities for irrigation.

The wide distribution of cotton, in all continents and many countries, indicates that this plant can be grown successfully on many kinds of soil. It appears that there are definite soil requirements, however, for growing cotton of certain types and varieties. For example, before the advent of the boll weevil, sea-island cotton was grown in South Carolina, Georgia, and Florida rather extensively. Since this kind of cotton sells for a higher price than any other, naturally many attempts to grow it elsewhere have been made. Most such attempts have failed.

Because of the superiority of the Egyptian cotton, growers in other countries have bought seed from Egypt and attempted to produce cotton of equal quality. In the dry, hot, irrigated sections of

the Southwest, insofar as our own country is concerned, some degree of success has been attained.

Both soil and climatic factors limit the adaptation of cotton varieties.

WORLD'S COTTON PRODUCTION

In 1891-92, the world production of cotton was only a little more than 12,000,000 bales. This figure did not include the number of bales grown in China, for at that time it was impossible to secure any accurate report of the quantity of cotton produced in China.

From 1891-92 to the opening of the World War in 1914, the trend in world production was steadily upward. Then came a slight decline. Soon increased production was resumed and went forward at a much more rapid rate.

In 1937-38, the world's cotton production, including China, reached a new peak. In that year 38,650,000 bales were grown. This crop was almost 7,000,000 bales larger than that grown the previous year, and with the exception of the previous year's crop and that of 1926-27, was larger by 10,000,000 bales than any other crop ever recorded.

Not many years ago, the production of 20,000,000 bales was regarded as a large world crop. But production has been increasing markedly for more than 50 years. Many Americans believe that the expansion of cotton growing in foreign countries is a recent development. Cotton growing has been increasing throughout the world for many decades. For 20 years prior to the beginning of the World War (1914) foreign cotton production had been increasing at an average rate of 150,000 bales each year. The well established trend was accelerated in the decade beginning with the cotton year 1928-29.

In 1906-7, the world produced its first crop of cotton in excess of 20,000,000 bales. For 20 years following this date the average world production remained fairly constant. But in the 10-year period from 1928-29 to 1937-38, the average for the world's crop was almost 28,000,000 bales.

SIX LEADING COUNTRIES

While there are 60 or more countries in which some cotton is grown, only 5 other than the United States are of great importance in cotton production. These are Brazil, China, Egypt, India, and the Union of Soviet Socialist Republics. Of the 19,000,000 bales produced in foreign countries in 1937-38, these 5 countries produced all except about 2,750,000 bales. It is necessary to study cotton in these 5 countries in

some detail in order to understand world trends and to get some conception of cotton's future possibilities in these nations.

UNITED STATES' POSITION

For almost 100 years following the invention of the cotton gin by Eli Whitney, the United States was the only nation producing any significant quantity of cotton for export. Great Britain and other cotton-consuming countries looked to us to supply the raw material to keep the wheels of their cotton-textile industry turning. There was no other important source of supply.

By the year 1891-92, the United States was producing three times as much cotton as all other countries of the world combined. Twenty-five years after this date, in 1916-17, we were still growing three-fifths of all the world's cotton.

But in the year 1933-34, the combined crop of foreign countries exceeded that of the United States. In this year our crop was reported as being 13,047,000 bales, while that of the foreign countries, including China, was set at 13,843,000 bales. In every year since this date, foreign production has exceeded that of the United States. For the year 1938-39, reports established our cotton crop as being 11,943,000 bales, while that of all foreign countries was 16,957,000 bales.

America no longer completely dominates the world's cotton markets.

Of course, the United States is the leading cotton-producing country of the world. There is grown in this Nation each year a crop at least three times as large as that of India, the second-ranking country in cotton production.

WORLD COTTON CONSUMPTION

In tracing the history of cotton we have seen how uses for the fiber and seed have increased. We have seen how a great industry has developed from the modest beginnings of the handwork of India and other countries. But we have also seen a vast increase in the quantity of cotton grown in the world. Naturally the question arises: Has cotton consumption kept pace with production?

In the quarter of a century following the beginning of the World War (1914), cotton consumption increased materially. It was stated, in discussing cotton production, that for a long period of years 20,000,000 bales was an average world crop. But there have been few years following 1915-16 when world consumption has not exceeded 21,000,000 bales. In 1936-37, a new peak was attained when world consumption totaled more than 30,000,000 bales.

Cotton consumption in the United States has not increased as rapidly as consumption in foreign countries. Each individual uses no more cotton than was consumed in the generations of our parents and grandparents. Increases in the consumption of American cotton at home have for a number of years been confined quite largely to industrial uses, such as the making of cord and fabric for automobile tires. It is true, however, that the total consumption has increased due to increased population.

World cotton consumption has been increasing quite consistently, but since 1920 in 2 years out of every 3, more cotton is grown than is used. In such years a part of the crop is held for future use. This part of the cotton supply is known as the carry-over. Increases in the carry-over tend to depress cotton prices. The world's crop and the world's carry-over make up what is known as the world supply. For the cotton year 1938-39 the world supply of commercial cotton was 50,000,000 bales—one of the largest ever recorded.

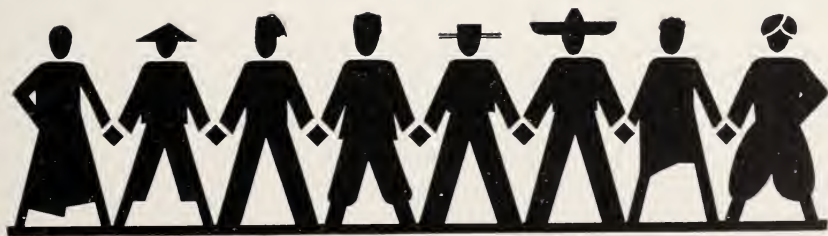
SUMMARY

1. Cotton is a warm-weather plant and requires a growing season of about 200 days.
2. The cotton belt of the world lies, in general, from about 40° north to 30° south latitude.
3. Cotton grows in countries that may be classified as hot-summer and cool-winter regions, hot-summer and mild-winter regions, and always-hot regions, or in warm lands that have (1) moderate rain at all seasons, (2) summer rain and winter drought, and (3) little or no summer rain but facilities for irrigation.
4. The world's cotton crop has been increasing markedly for 50 years.
5. There has been little or no increased per capita consumption of American cotton at home for a long period of years, but the total consumption has increased with the increase in population. Although exports of American cotton have decreased since the large volume of the early 1930's, the total consumption abroad is increasing.

PART TWO . .

COTTON *in*

FOREIGN LANDS



DO YOU KNOW: *What advantages in cotton production make it possible for India to rank second only to the United States among the cotton-producing countries of the world? Why the cotton production of India fluctuates but little? Whether there is more land available in India for increasing the acreage devoted to cotton? What land-use problems India must solve? What conclusions can be reached with respect to the future of cotton in India?*

INDIA—THE HOME OF COTTON

Ancient India is known as a land of mystery. And time has brought to the United States too little information about present-day conditions in this interesting country. Perhaps the typical American citizen knows less about India than any other important cotton-producing section of the world. This lack of information is due to many causes, including the distance between the two nations.

If the typical American citizen were asked to name an important country on the opposite side of the earth, the universal reply would be China. But it would be quite as correct to answer the question by saying India.

A voyage to India from America, which would require about 3 weeks, might be started by crossing either the Atlantic or the Pacific Ocean. If a traveler departed from our eastern seaboard, he would reach India at the city of Bombay; from our western coast, he would probably dock at Calcutta. Both are cities of more than 1,000,000 people.

India has a population of 375,000,000 persons, which is approximately one-sixth of all the people of the world. While just one-half the size of the United States, this country of the Far East has a population three times as large as our own. In some sections of India there are 600 persons living on each square mile. The average density of the population of this ancient land is about 200 persons to the square mile, while ours in the United States is about 40 persons. Only in a few places, such as in parts of China, Japan, Egypt, and Java can be found such pressure of people upon the land as exists in India.

Three-fourths of all the people of India make a living from farming and the grazing of livestock. Only 10 percent are engaged in industrial pursuits, and 5 percent in business or trade. The remaining 10 percent are engaged in miscellaneous occupations, such as professions, public administration, and domestic service.

India is a very old country, and, perhaps, to a greater extent than in any other part of the world, the people are bound to the traditions

and customs of the past. This is perhaps indicated to the greatest degree in the Hindu caste system. Each individual, under this system of social organization, belongs to a caste. A caste is composed of groups bearing a common name and having for the most part the same occupation.

The caste system makes changes in social and economic conditions far more difficult than can be fully appreciated by persons living in a democracy. For example, if a man's father is a farmer, he, too, must be a farmer. If there should be a surplus of persons living in a city, it would be impossible for those not required in urban occupations to move to some other location to engage in farming for all must follow forever the occupation of the caste to which they belong. Likewise those belonging to a farming caste must remain in this work even though a great demand for workers in other fields might exist.

There are well over a thousand recognized castes in India. Hundreds of these are self-contained groups living apart from all other groups. In fact, it is thought that one caste may pollute another; some by touch, others by coming within a specified number of feet of each other may be defiled. That there is a sharp line of cleavage or distinction among the castes can be appreciated also when one learns that an individual must marry within the caste of which he is a member.

TWO SEASONS

The seasons in India are as different from those of the United States as are the social philosophies of the two countries. Instead of having the four seasons with which we are familiar, India has only two—the wet and the dry.

The dry season begins in November or December and lasts until May or June. This is followed by the wet season, which is called the monsoon. If the rainy season is delayed or fails to develop, great suffering results. There have been years when no rain fell in India; these have been years of famine and pestilence.

Water is the limiting factor in the life of India. The teeming millions who live in the country are not evenly distributed. They are found in great numbers where there is water available for the production of food.

COTTON IN INDIA

India ranks second among the world's cotton-producing countries. For the 15-year period following 1925, the average annual production was more than 4,000,000 bales. While this is less than one-third as large as the average crop of the United States during the

same period, it is almost twice as large as the production in China, which ranks next to India as a cotton producer.

In quality of cotton grown, however, India's rank is far lower than its rank in quantity production. No other country, with the possible exception of China, produces a crop with so large a proportion of short staples. Of India's total crop, 70 percent is less than seven-

YIELD AND PRODUCTION OF COTTON IN INDIA AND IN 5 OTHER MAJOR COTTON-PRODUCING COUNTRIES—AVERAGE 1924-38



EACH YIELD SYMBOL REPRESENTS 100 POUNDS OF LINT PER ACRE
EACH PRODUCTION SYMBOL REPRESENTS 1,000,000 BALES OF COTTON

eighths inch long. In addition to growing a very poor quality of cotton, India's acre yields are the lowest of any major cotton-producing country.

Since the opening of the twentieth century, cotton production in India has fluctuated but little. The production ranged from a low of 2,730,000 bales in 1911-12 to 5,285,000 in 1936-37. Only three times within a period of 35 years has the crop of India reached the 5,000,000-bale mark. The acreage has varied, since 1900, from 21,000,000 to 28,000,000 acres. It may be noted from these figures that the production of lint per acre in India is far below that of the United States.

The making of cotton cloth has become an important industry in India. For many years Great Britain supplied a very large portion of cotton-textile products used by the Indian people. But as cotton mills were increased in India, smaller importations were required. Since Great Britain bought from the United States most of the raw cotton for making this cloth, sales of our cotton have decreased somewhat in relation to the expansion of the textile industry of India. Within two decades these sales were reduced by approximately 650,000 bales annually. That such an important textile industry has been developed from home-grown cotton is evidence that India enjoys many advantages for cotton growing.

ADVANTAGES FOR COTTON GROWING

India has produced cotton commercially for centuries. Cotton is, therefore, a firmly established part of its agricultural system. The country is operated largely on a self-sustaining basis and vast quantities of cotton cloth are required to meet the needs of her own people, even though the per capita consumption is only 4 pounds each year. India is located near the most densely populated regions of the earth and has in the people of these regions a very large and convenient outlet for any additional cotton that might be produced. Furthermore, India is a part of the British Empire and it is a policy of that Government to make her colonial possessions as productive as possible. Naturally, the British people would like to see the cotton crop of India increased in order that she might play a more important part in the world of trade. All of these considerations make it desirable for India to increase its cotton production. What are the possibilities for further expansion? And what are the advantages which have made it possible for India to rank second among the cotton-growing countries of the world?

Climatic conditions are in several respects favorable for the growth of the cotton plant in India. A large part of the country is always hot, and most of the remainder has no season that is cold. The

average annual rainfall is less than might be considered necessary for cotton-growing in such a hot country. Most of this rain, however, falls during the summer months and so gives a larger supply of moisture to a cotton crop than would an equal amount of rain distributed throughout the year.

Part of India is much too dry for rain-grown crops. But in north-western India snow-fed rivers from the Himalayas make possible the irrigation of large tracts of land. One recent irrigation project in the Indus River Valley added to India's cultivated lands an area larger than all Egypt's agricultural land. Moreover, in parts of India where



there is very little rainfall, some water has been provided by digging wells, or by constructing dams across river valleys, thus forming lakes, ponds, and reservoirs. The British Government has been responsible for much of the irrigation work that has been carried on in modern India.

In the natural fertility of some of the soils may be seen another advantage of India for cotton production. Fine alluvial soils are found in parts of the Indus River and the Ganges River flood plains. Near Bombay there is a rather large area of soil similar to the "black waxy" soil of central Texas. In India, as in Texas, the moisture-retaining quality of this soil is important in the growing of cotton. In much of



1



2



3



4

Cotton in India

1. *Plowing under a leguminous crop*
2. *Cotton pickers*

3. *Members of a cotton cooperative*
4. *Weighing cotton*

this particular section of India rainfall is too scanty to permit the growth of cotton in soil of loose texture.

In summarizing the advantages that India has for cotton growing, the following favorable factors must be listed: (1) A suitable climate, (2) rather productive soils in limited sections, and (3) an abundance of labor. In addition, India has a very large market at home and in Japan; has the aid of the British Government; and has had centuries of experience in cotton production. All these conditions are so favorable that future expansion might be expected. But before any conclusions may be drawn the problems involved in further expansion must be given consideration.

DISADVANTAGES OF INDIA

Even though India has natural advantages for cotton growing, she also has disadvantages, the most outstanding of which is the vast population for which food must be produced.

India's teeming millions must be fed. This limits the land that may be used for cotton and other cash crops. Rice—the most important cereal crop of the world—is the leading crop of India, covering more than three times the acreage devoted to the growing of cotton. Relatively large acreages are devoted to the production of the pulses—those leguminous crops that are used for food. To such crops as these India must give first consideration.

Another great difficulty to cotton expansion and improvement is the conservative nature of the farmers of India. Throughout much of India the primitive methods of ancient times are still in use. Many people are bound by tradition as well as habit. For example, it is believed that all kinds of crops grow better when planted together. Cotton and other crops may be seen growing in the same fields, all receiving the same cultivation regardless of their respective needs. Some of this mixing of crops may have been started for very good reasons. For instance, in some parts of India where drought is frequent, cotton is often mixed with grain sorghum. If rainfall is too scanty for the cotton to grow, there may still be a cereal crop to harvest.

Indian cotton in Bombay



The immediate agricultural possibilities of India are limited by the extent of her productive lands and the character of her people. Only the development of additional vast irrigation systems which might bring new land into cultivation can materially increase cotton production in the land that was probably the original home of the cotton plant.

SUMMARY

1. For many years there has been little change in the quantity of cotton produced in India. There are reasons to assume that cotton production will not materially increase because the land area is limited; there is need for food for the growing population.
2. India is favorably located for selling cotton to the countries of the Far East, which have large populations and a growing textile industry.
3. The quality of Indian cotton is poor.
4. The yields per acre are very low and the farming methods primitive.
5. The caste system makes it difficult to bring about changes in India. This applies to the introduction of new and improved farming methods as well as to other economic and social changes. And so long as the system prevails it may be assumed that little change will take place in agricultural practices.
6. To feed India's 375,000,000 people, a very large part of the farm land must be devoted to the production of food crops, thus limiting the acreage that may be devoted to cotton.

DO YOU KNOW: *How much cotton is grown in China? What is done with this cotton? Under what conditions it is produced? Whether the United States can continue to find a market in China for cotton and cotton goods? Whether China can develop a textile industry that will supply her needs? China's problems in cotton production? The use made of China's available resources? Her problems in agriculture as a whole?*

COTTON IN CHINA

The agriculture of China has a recorded history so old that the Chinese have been called "farmers of 40 centuries." Cotton, however, was not extensively grown in China until about A. D. 1300. That seems a long time ago, for our country is young. But Chinese history goes back so far that A. D. 1300 is a relatively recent date.

When the Chinese became acquainted with cotton, they planted it in gardens, and even wrote poems about the "fleece" that grew on trees. Only slowly, however, did cotton become a common plant or commodity in China. Not until the twentieth century was it cultivated on a large scale.

During recent years cotton has occupied a more important place in Chinese agriculture. Among the major cotton-producing countries of the world China usually ranks third. One reason for the importance of cotton growing in China may have been the agitation against the growing of opium. Another cash crop was needed to take the place of this source of income.

Unlike most other large producers of cotton, China uses nearly all of her crop at home. The Chinese also use raw cotton imported from the United States and from British India. In addition, cotton cloth is imported.

It is easy to understand the large consumption of cotton in China. In all of China in summer, and in southeastern China all the year, cotton is an appropriate clothing material. Even in Middle and North China cotton clothing is used because most of the people are too poor to buy woolen garments.

Fuel in China is scarce and expensive; little heat is provided in the homes. To make the cotton clothing as warm as possible, the winter coats are padded with cotton. When the weather gets colder, the people put on another layer or two of clothing. This is why the Chinese sometimes speak of "two-coat" or "three-coat" weather. When the little Chinese children are all bundled up for "three-coat" or "four-coat" weather, they look like padded and quilted balls running around at play.

CHINA'S INTEREST IN COTTON

In view of the rather large production of cotton in modern China and the great use made of cotton, do you wonder why the Chinese were so slow to begin producing it in more than limited quantities?

The answer is not to be found in unfavorable conditions of climate, for widespread cultivation of cotton is possible in North and in Middle China. The growing season is long enough; rainfall, while limited in North China, comes during the growing season.

Nor can it be said that cotton culture in China expanded slowly because of the lack of productive soils. Fertile flood plains border



the Yellow River in North China and the Yangtze River in Middle China. Other large parts of North China have deep, fertile soil called loess, which was brought by the wind from the dry interior of Asia. The farmers of some sections have used their soil well, sparing no labor that would make it more productive.

Perhaps a part of the explanation of China's slow development of cotton culture may be found in the conservative nature of the Chinese people. Perhaps the reluctance of the Chinese to accept the new—either in ideas or commodities—may be related in some measure to geographic conditions. For long ages China was superior—both in

culture and material wealth—to all other countries with which she had contacts.

So little need or desire did China feel for anything which outside countries could supply, that western nations found it difficult to develop trade with her. Many of the luxuries desired by the people of Europe and the New World could be secured in China, but the West apparently had nothing that was needed by self-sustaining Old China.

China needed cotton cloth, however, for what fiber could at once be so useful and so cheap?

MODERN TRENDS IN CHINA

In 1917-18 the cotton crop of China was estimated to be about 2,000,000 bales. Less than half of this was spun by modern mills, while the remainder was largely processed in the Chinese homes. A small quantity of raw cotton was being exported while improved staple was imported for use in the mills. At this same time large quantities of yarn and piece goods were being imported.

In recent years, however, the cotton textile industry has been shifting from Europe to the Orient, with the major development of the East in Japan and India. Cotton mills have been built in China as a phase of this industrial shift. In China mills have been built with native and foreign capital, the latter chiefly from Japan.

Since 1920 Chinese mills have been supplying an increasing part of the cotton cloth used in China. They are also exporting some cloth. Between 1913 and 1932 China changed from a major to a minor market for foreign-made textiles.

China's sales of raw cotton to Japan have been increasing continuously for 40 years. In 1902, for example, such sales amounted to 200,000 bales; 300,000 bales in 1910; and 400,000 bales in 1938.

CHINA'S NEW PROGRAM FOR COTTON

Can China become self-sufficient in raw cotton and cotton goods? Is it possible that she may have a large surplus of either or both for export? These are questions in which American citizens dependent upon cotton for a living are greatly interested.

It is thought that China can, with improved methods, supply herself with all the cotton she uses. The Government has set such a goal. The tariff on cotton was increased in order to raise prices and thus encourage Chinese farmers to grow cotton. Efforts are being made to improve the quality of Chinese cotton, which is admitted to be low. China's cotton program includes definite objectives along the following lines: (1) Seed improvement, (2) grading and inspection

service, (3) regulations against mixing, (4) cooperative marketing facilities, and (5) expansion and improvement of the textile industry.

It is estimated that China's cotton crop may, in the next 10 or 15 years, increase as much as 1,500,000 bales. If living standards improve, this increased production will be required for domestic use since China's population, including Manchuria, is estimated as being approximately 450,000,000 people.

COTTON MILLS IN CHINA—AVERAGES BY SELECTED YEARS

1910-14



1915-19



1920-24



1925-29



1930-34



1935-36



EACH SYMBOL REPRESENTS 10 MILLS

Average production in the period 1923-24 to 1932-33 amounted to about 2,500,000 bales; China's bumper crop of 3,870,000 bales produced in 1936-37 exceeded domestic requirements and the country became a net exporter, including the sale of yarn and cotton goods.

It seems possible, too, that China may produce the better grades of cotton which she is now importing. American upland varieties have been introduced and successfully crossed with Chinese varieties. But it must be understood that the quality of Chinese cotton is very poor.

DIFFICULTIES TO BE OVERCOME

There does seem, however, to be a definite limit beyond which China's cotton expansion is not likely to advance. Some of the difficulties to be overcome include limited rainfall and floods, lack of transportation facilities, limited consumption, based upon standards of the United States, and lack of land that can be spared from the production of food crops.

North China, in spite of popular opinion, has a growing season of 225 days. It meets all the temperature requirements for growing cotton. But lack of sufficient rainfall in the early summer often retards the growth of farm crops. On the other hand, Middle China, where two crops may be grown in the long period of favorable weather, has the handicap of too much rain, especially in the autumn harvest season. Typhoons, causing serious damage, occasionally occur in Middle China.

Both North and Middle China are subject to floods resulting from the overflow of the Yangtze and the Yellow Rivers. The Yellow River is similar to our Mississippi River in its habit of overflowing its banks and changing its channel. So frequent and so destructive have been the floods of North China that the Yellow River is called "China's sorrow."

Transportation is a major problem in China. It is so slow and expensive in most parts of the country that large scale commercial production of cotton is out of the question except in those regions that are near the centers of cotton manufacturing or the ports through which cotton is shipped to Japan.

The possibilities for the increased consumption of cotton goods in China are limited by the general economic conditions which prevail. While China has an enormous population, the majority of its people are poor and consequently not able to buy many commodities for which it has an urgent need.

Perhaps the most important factor in limiting the cotton production of China is the lack of productive land. The tariff placed upon cotton imports has aided prices and drawn attention to the possibilities of the crop. But once the domestic supply is produced, the

tariff will become ineffective in raising the price of the domestic crop. And there is scarcely enough suitable land to supply the food needs of the Chinese. In parts of China that can be used for farming, the average pressure of the population on the land is perhaps greater than in any other country on earth, with the possible exceptions which may be found in India, Japan, Java, and Egypt.

FARMING CONDITIONS IN CHINA

Four-fifths of China's people are peasants, dependent upon the soil for their living. Land holdings, compared with those in the United States, are unbelievably small. Even in normal years unceasing toil and thrift are necessary to make the land yield enough for the bare subsistence of the people who live on it. Through many centuries the patient Chinese have devoted their time and energy to the task of bringing their land to the highest possible state of productiveness.

In order to increase the area of cultivated land, slopes have been terraced. In China, the work of terracing cannot be done quickly and easily with machines, as some terracing is now being done in the United States. Stones must be carried, usually by hand, for building the retaining walls. Then dirt must be taken in baskets, a little at a time, to build up a level strip of garden land behind each wall.

Commercial fertilizer is too expensive to be bought by most Chinese farmers, but they use all available sources of fertilizer that cost only human labor. (Human labor is described as the cheapest commodity in all China, because people are so many and paying jobs are so few.) For instance, the silt that collects in the canals is often scraped up, carried to the fields—garden plots, they would seem to us—and carefully used as fertilizer for the growing plants.

Agricultural land in China is so precious that to a citizen of the United States it seems almost to be measured in square inches rather than in acres. Even the little embankments that surround the rice fields are not wasted. Beans or other vegetables may usually be seen growing there. Along the margins of roadways or footpaths the same is true. Vegetables are often planted between the rows of other crops.

In regions so crowded as the densely populated parts of China, where there is such a narrow margin between food and famine, drought and flood are more disastrous than in lands where living conditions are less difficult. Poor transportation facilities also make it difficult to send food supplies into famine-stricken areas, even if funds are available for relief work.



Cotton in China

1. Hoeing cotton.
2. A home industry.
3. Rail transportation of cotton.
4. A peddler of cotton goods.
5. Cotton goes to market.
6. Tientsin—A market center.

The frequently recurring famines of China—especially in North China—are thought by some students to have been an important factor in the development of some of the traits of character for which the Chinese are noted. Thrift and hard work are essential in the life of the Chinese peasant, even in good years. When crops fail and famine comes, the patient and conservative type of person is the one most likely to survive. The restless ones leave home, hoping to find food elsewhere. Many of those who leave either perish on the road from hunger, or die in the cities from disease. The stay-at-homes, by taking as little activity as possible and eating just enough food to keep them alive, may manage to live through the famine season.

The ever-present menace of food shortage also encourages the conservative rather than the progressive attitude toward agricultural practices. Often the Chinese farmer feels that there is too much risk involved in trying some new crop, or in adopting new methods. So it may be concluded that the “farmers of 40 centuries” will not move rapidly in the further expansion of cotton production. It is impossible, however, to determine the ultimate effects of the Japanese invasion of China as it relates to the cotton situation in the Far East.

SUMMARY

1. China usually ranks third among the cotton-growing nations of the world, her production for many years being exceeded only by the United States and India.
2. The trend in cotton production in China was upward for a number of years prior to the Japanese invasion.
3. The trend in cotton manufacturing is upward. Chinese cotton mills supply most of the cloth used in China.
4. The Government has an aggressive cotton program looking to expansion and improvement of both production and manufacturing.
5. China is quite largely a self-sustaining cotton country, but under favorable conditions, could grow more cotton than is used at home.

DO YOU KNOW: *How much cotton is grown in Egypt? That Egyptian cotton is famed throughout the world for its quality? What is done with Egyptian cotton? What the conditions are under which cotton is grown? And whether in the future Egypt is likely to grow more or less cotton than in the past?*

EGYPTIAN COTTON

Egypt ranked fifth among the countries of the world in cotton production in 1937-38. Larger crops were grown in the United States, India, China, and the Union of Soviet Socialist Republics. The cotton crop of Egypt was less, in bales, than that produced in our own State of Mississippi; yet the cotton crop of Egypt is far more important, both to the people of that country and to the people of the world, than might be imagined if only the number of bales is considered.

There are, at least, three important facts to think about in connection with the cotton crop of Egypt. These are: (1) Almost all the cotton grown in Egypt is sold to other countries; therefore Egypt is an important factor in the world trade of cotton; (2) Egypt supplies almost one-half of the world's long-staple cotton; (3) cotton is almost the only cash crop of the people of Egypt, 85 percent of whom make their living farming.

Egyptian cotton is sold to all major consuming countries of the world. Among the nations buying cotton from Egypt are included the United Kingdom, France, Germany, Italy, Switzerland, Japan, Spain, British India, and the United States. More than 80 percent of Egypt's annual production is exported. The principal reason for the popularity of Egyptian cotton is its long staple. It was estimated by the Bureau of Agricultural Economics that for the 5-year period 1927-32 Egypt produced annually 1,398,000 bales of cotton with a staple length of $11\frac{1}{8}$ inches or longer.

Egypt is a very old country. Many stories are told in the Bible about this ancient land. Yet cotton has been grown extensively in Egypt only during the past century.

In 1862 Egypt produced only 150,000 bales of cotton. The War between the States in our own country gave to Egypt a great opportunity to produce cotton. During the war, ports of the southern United States were blockaded; thus the usual supply of cotton could not be exported. Great Britain, needing cotton at that time for its growing textile industry, turned to Egypt. Within 2 years (1862-64) the Egyptian cotton crop increased from 150,000 to 400,000 bales. By 1892 the annual production amounted to 1,000,000 bales, and cotton had

become Egypt's leading cash crop. From that time to the beginning of the World War (1914), although there were many ups and downs in production, the general trend was upward. This upward trend has continued for the past 20 years with the result that a crop of 2,282,000 bales was produced in 1937-38. Much of the increase since 1924 has been due to larger yields per acre.

Will this upward trend in cotton production in Egypt continue in the future? This is a question of grave concern to the cotton growers of America. In an effort to answer this question it is necessary to study the country, its people, and the conditions under which cotton is grown.

NATURAL CONDITIONS IN EGYPT

Water is the limiting factor in farming in Egypt. The country is too dry at all seasons of the year for profitable crop production, except in those regions where water may be supplied from the Nile River.

Those of us who live in the eastern Cotton Belt of the United States can scarcely imagine a country with so little rainfall as Egypt. In our eastern Cotton Belt the average annual rainfall is perhaps 40 inches; in Egypt it is less than 5 inches.

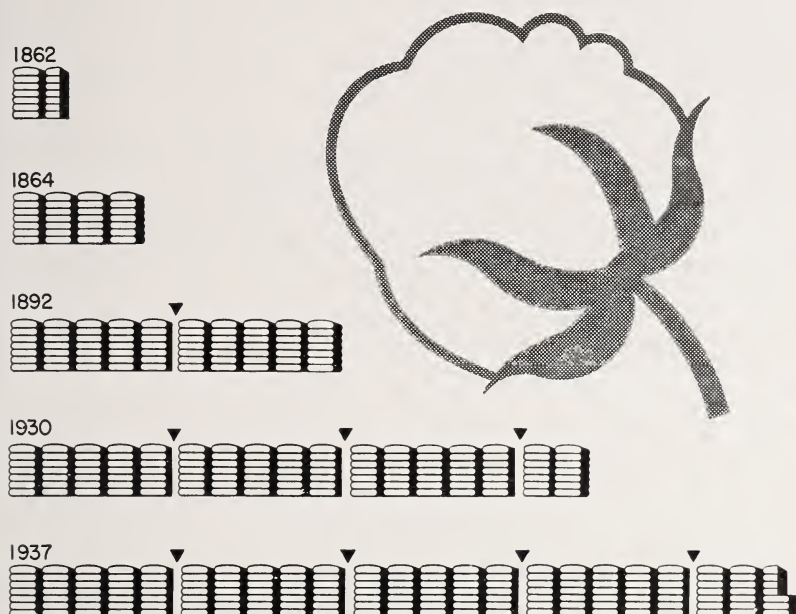
The floods of the Nile have, from the dawn of history, insured good crops in the delta and in the valleys of the Nile.

The people of Egypt live almost entirely in that part of the country which is watered by the Nile. They are crowded together in a very

Egyptian cotton ready for exporting



EXPANSION OF COTTON PRODUCTION IN EGYPT



EACH SYMBOL REPRESENTS 100,000 BALES OF COTTON

small area. In the delta, which is about 150 by 120 miles in size, there are about 1,000 persons to the square mile, as compared with an average of about 40 for the United States. The valley above the delta stretches out like a ribbon for 600 miles. At no point is it more than 20 miles wide. This—the delta and the valley—is the farming area of Egypt.

Farms in Egypt are small; some no larger than 1 acre in size; the average size is 2.47 acres. The people live in villages, so that as much land as possible may be planted to crops. It is a warm country, with some crops growing each month in the year.

GROWING COTTON IN EGYPT

Cotton requires water in the spring and early summer, when the Nile is lowest. This explains why the commercial production of cotton was delayed until the development of a more dependable water supply.

About 100 years ago Egypt had a very progressive ruler by the name of Mehemet Ali Pasha. He has been called the founder of modern Egypt.

Mehemet Ali Pasha, realizing the need of his people for more dependable sources of income, decided to build factories in which they might work. To a very great extent his efforts failed, so he turned to cotton growing as a means of providing employment and income.

Seeds were imported, probably from the Sudan, and soon cotton became an important source of revenue for the Government. Private landowners also began to grow cotton, and, as has been stated, by 1862 the country was producing 150,000 bales a year.

During the days of more primitive methods of farming in Egypt, basins and canals were constructed to hold and carry the flood waters of the Nile. In 1835, the first dam was built in Egypt, about 12 miles north of Cairo. This was the first step toward a system of all-the-year irrigation. About the opening of the twentieth century a dam, known as the Aswan Dam, was constructed across the Nile about 600 miles south of Cairo. An already-built irrigation canal, which had previously been useless except during the flood season, could then be used in the low-water season as well. The great success of this undertaking encouraged other irrigation works. The Aswan Dam added more than 1,500,000 acres to the cultivated area of Egypt. This is more than one-fourth of all the Egyptian land now used for growing crops. The dam itself is $1\frac{1}{4}$ miles long and cost many millions of dollars. Four-fifths of Egypt's cultivated land now has an assured water supply throughout the year.

The soil of the farming area of Egypt is very fertile; the acre yields of cotton are much higher than those made in the United States. Since cotton is the leading cash crop of the people, it is expected that Egypt will continue to grow as much cotton as it is economical to produce.

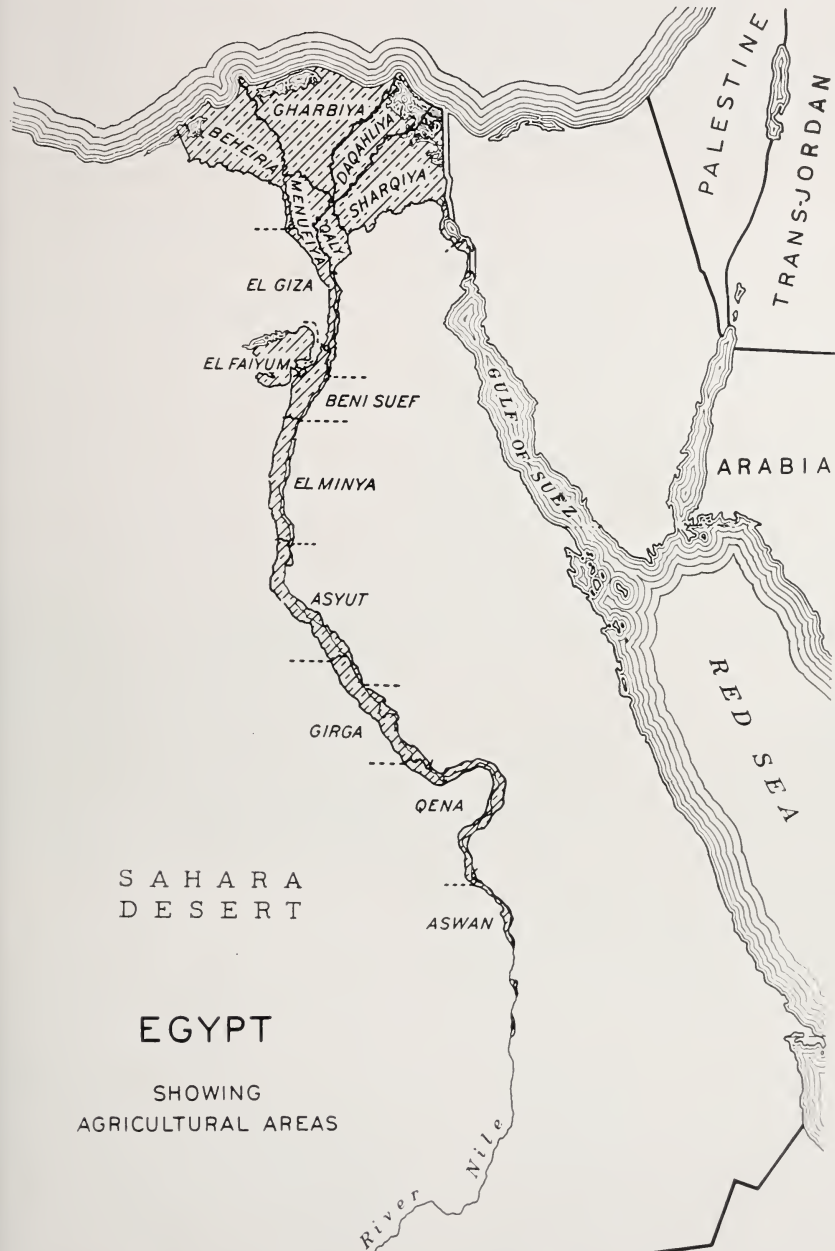
Some of our eminent cotton authorities in the United States are inclined to the opinion that the peak in Egyptian cotton production has been reached and that there are many difficulties to be overcome if her position is maintained.

FARM PROBLEMS IN EGYPT

Among the more important cotton farm problems of Egypt must be included (1) the supply of water; (2) the control of insects; (3) the maintenance of soil fertility; and (4) competition with food crops for supplying the needs of a very dense population.

The Nile is an international river. Only 1,000 of its 4,000 miles is located within the boundaries of Egypt. Before entering Egypt it flows through the Anglo-Egyptian Sudan. The people of Egypt realize that if great irrigation works were constructed in the Sudan their supply of water would, to some extent, be decreased. They realize, too, that the Sudan might give them additional competition

for their long-staple cotton in the markets of the world. Thus far cotton growing has not proved very profitable for the people of the Sudan. Their annual crop is about 200,000 bales. What will happen





Cotton in Egypt

1. Egyptian cotton pickers.
 2. Irrigation cotton.
 3. A cotton yard.
 4. Cultivating cotton.
 5. Aswan Dam.
-



in such international affairs only time can tell. The results, in any event, might not be very significant for the cotton growers of the United States, for a decrease in Egyptian cotton would doubtless be offset by increased production in the Sudan.

The pink bollworm is one of the insect pests which seriously threaten the cotton crop of Egypt and other countries. This pest is feared in the United States more than the Mexican boll weevil, but the cotton growers of Egypt will undoubtedly be able to cope with the pink bollworm.

Before irrigation dams were built in Egypt each year the Nile brought new, fertile soil and spread it over the cotton fields. The land was very rich. No commercial fertilizer was required.

The present methods of farming, however, make it impossible to depend upon nature for an inexhaustible supply of plant food. Scientific farming must replace primitive methods. Crop rotations must be practiced; some changes must be made in the systems of irrigation; and, in time, commercial plant foods may be necessary. But these changes can be made, for Egypt has a marvelous record of achievement in cotton production.

In 1920, a low point in production per acre was reached in Egypt when the growers averaged approximately 300 pounds of lint per acre. Since that time there has been an increase in acre yields so that in 1937-38 an average yield of 500 pounds of lint per acre was attained. This is a larger acre yield than that of any other major cotton-growing country of the world.

It must be remembered in considering the cotton-growing possibilities of any country that food production is the most important use of land. Only when a fairly adequate food supply is assured can any large area of land be devoted to other uses. In Egypt, as in India, China, and other densely populated countries, the growing of food crops presents a difficult task. The population of Egypt is increasing which means that more food is required to sustain the population. This food must be produced in the limited farming lands watered by the Nile or it must be imported from other countries. In either event it would appear that there is little possibility of materially increasing the amount of land in Egypt that can be used for the growing of cotton.

SUMMARY

1. Egypt produced more than 2,000,000 bales of cotton in 1937-38, ranking fifth among the cotton-growing countries of the world.

2. The cotton of Egypt is outstanding in quality, nearly all being classed as long-staple cotton.
3. Practically all of the cotton grown in Egypt is sold to other countries. An unusual demand for this cotton exists due to its long staple which makes it desirable or essential for certain textiles.
4. The trend in cotton production in Egypt is upward and has been since 1862.
5. The natural conditions for growing cotton in Egypt are favorable as is evidenced by the fact that this country has the highest acre yields among the cotton-growing countries of the world.
6. It is not likely that cotton production in Egypt will increase in the future as it has in the past for several reasons: Primarily, food production requires an important amount of available land; then, too, cotton can be grown only on land irrigated with water from the Nile. Since this water can be carried only to the delta and the valley and since practically all of this land is already in production, there is not likely to be any material increase in Egyptian production. It is possible, however, that modern methods and the construction of great dams in the Anglo-Egyptian Sudan may result in increased production in this section of Africa.

DO YOU KNOW: *Why cotton acreage and production have increased so rapidly in the Union of Soviet Socialist Republics? What part of the vast area in the Soviet Union is adapted to cotton growing? What further increases, if any, may be expected? Whether the United States may hope to sell cotton to the Soviet Union in the future? Whether the new farming systems are permanent? And whether the Union will continue to be self-sustaining in cotton production?*

THE SOVIET UNION'S COTTON PROGRAM

The Union of Soviet Socialist Republics, formerly Russia, or, as it is commonly known, the "Soviet Union," is an immense country. It occupies one-seventh of the earth's land surface. From east to west it spreads over 5,400 miles, while its greatest width is 2,400 miles. It has a larger continuous area than any other country in the world, and is more than twice as large as the United States. About 22 percent of this country is in Europe and 78 percent in Asia.

In 1936, the Soviet Union had a population of 166,000,000 people.

Before 1917 this country was an absolute monarchy. The ruling monarch was known as the Czar. But the Government was overthrown and everything was changed—even the name of the country. Formerly the country was called Russia, and comprised what was officially known as the Russian Empire.

At the close of 1937 the Soviet Union was composed of 11 Union Republics which, in turn, included 22 self-governing republics and 9 autonomous provinces. These self-governing republics and provinces were bound together through the political power of a supreme council elected by the people.

In the Soviet Union practically all work is done on a collective basis under the direction of departments of the Government. There are, for example, departments in charge of communication and transportation. Banking is centralized in a State bank under Government control. Distribution is socialized, with retail trade in the cities conducted mainly by local administrative bodies, and in the villages by consumer cooperatives. Industrial operations are regarded as State enterprises.

Notable changes that have taken place in this country since the time of Czarist Russia have been charted in the 5-year plans. The first of these plans terminated in 1932, the second in 1937; a new plan was inaugurated in 1938. These plans deal with the economic policies of the Soviet Union. Each year, objectives or goals of attainment are announced. Emphasis has been placed upon indus-

trial development, for prior to the establishment of the Soviet Union, 80 percent of the people of the country were engaged in farming.

CHANGES IN FARMING

Great changes in farming have taken place under the present regime.

Years ago Russia was a country of millions of little farms. The operations of the peasant families were often confined to 12 or 14 acres of land. Today the farms are not only larger, but plans for their operation have been completely changed.

There are three types of farms found in the Soviet Union. These are (1) collective farms; (2) State farms; and (3) independent farms.

On the collective farms great numbers of workers operate large tracts of land in common; that is, they plant, cultivate, and harvest fields of crops in which they have a collective or group interest. Large-type machinery is commonly used. In addition to sharing in the field crops produced, all those who work on collective farms have their own family garden plots and domestic animals.

A farmer from a collective farm





Assembling seed cotton on a collective farm

The State farms are operated upon what we would regard as an industrialized basis. Improved, large-type machinery is used exclusively on these farms. They are operated by the Government.

Independent farms are more nearly like those that existed before the Union of Soviet Socialist Republics was formed.

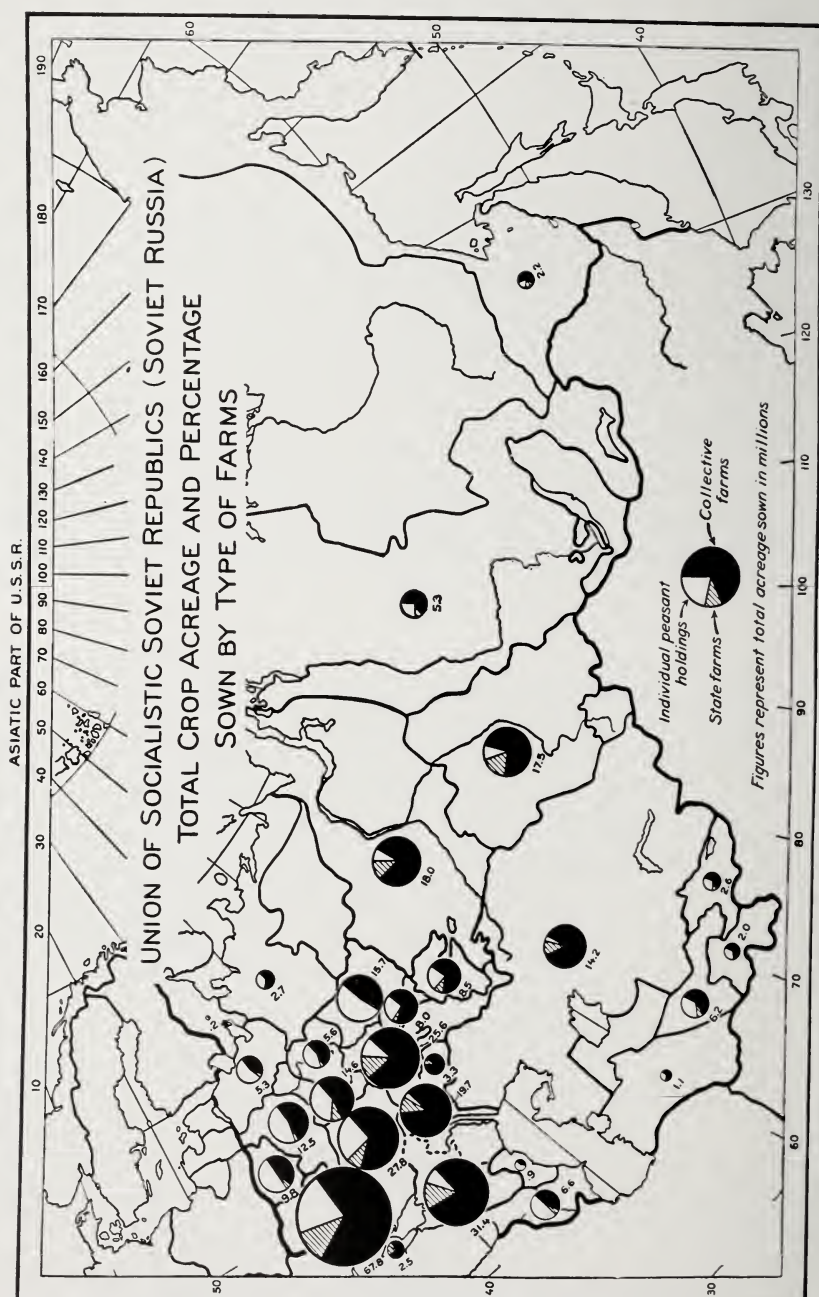
COTTON PRODUCTION INCREASE

That collective farms have resulted in increased cotton production in the Soviet Union is revealed by a study of the reports over a period of years.

Between 1910 and 1914, which is used as the base period in making studies of agriculture in the United States, the average annual cotton production of Russia was about 900,000 bales. Under the rule of the Czars the largest annual crop since 1900 was 1,512,000 bales. But, in 1938-39 the Soviet Union grew 3,800,000 bales.

During the base period Russia produced only about one-half of the cotton consumed in her textile mills. But as early as 1933 under the regime of the Soviet Union, 97 percent of the requirements of her textile mills was produced in the cotton fields of the Republics.

Naturally those citizens of the United States who appreciate the





Hauling cotton to market

importance of foreign outlets for cotton grown in this country are anxious to learn how the production of the Soviet Union was increased so rapidly.

COTTON PROGRAM

The Soviet Union's 5-year plans have been given widespread publicity. As has been stated, each year new objectives are announced. Shortly after the first 5-year plan was adopted, the following decree was issued:

The development of cotton production in the current 5-year period (1928-32) must follow the lines of maximum utilization of all resources for the increasing of cotton acreage and the increase of cotton yields in order to be able at the end of the 5 years to free the textile industry of the Soviet Union from the necessity of importing foreign cotton, and also to have the necessary (reserve) stocks for further development of the textile industry.

During the period of the first 5-year plan (1928-32), a great expansion in cotton acreage took place, but the yield per acre declined. During the period of the second 5-year plan (1932-37), a campaign was conducted to increase production per acre. The effort was successful.

The progress achieved during this 10-year period was the result of inaugurating a Government cotton program. Under the provisions

of this program every farmer in the cotton-growing regions was given a contract which outlined the steps to be followed in cotton production. Planting seed was distributed by Government representatives. Agents were appointed for supervising production and harvesting. All gins are owned by the Government. And when the crop is made it is turned over to the Government at a fixed price.

In addition to the regulations which control every step in cotton production from securing the planting seed to ginning the crop, the Government has established experiment stations that seek to improve the quality of the cotton grown, perfect new and improved farm implements, and make possible any other aids in attaining the established goals. Awards are made to farmers who achieve outstanding results at any task. Perhaps no factor has been more important in the progress made, however, than the extensive use of tractors and improved farm machinery.

MACHINE-TRACTOR STATIONS

The machine-tractor stations represent one of the new developments under the Soviet regime. These are associated with the collective farms. They might be said to be service stations for such farms. In addition to supplying the machinery for many of the more important farm operations, technically trained experts are located at these stations for the purpose of aiding the workers in solving the more involved problems with which they must deal.

From the machine-tractor station the workers on a collective farm obtain a contract for having certain work done such as plowing, harrowing, seeding, and cultivating. The farm pays the wages of the tractor operators and a certain percentage or quantity of the crop per acre for the performance of each job specified in the contract. Not all the work on these farms is done by the machinery from the stations, however, for each collective farm has some workstock and implements of its own.

The growth of mechanized farming has been very rapid. In 1930 there were 158 Government-owned machine-tractor stations, and 5,000 in 1936. There were 17 stations specializing in cotton growing in 1930 and 452 stations 5 years later.

Collective farms are producing most of the cotton grown in the Soviet Union. In 1935 there were 4,827,000 acres of cotton planted, of which about 4,300,000 acres, or 89 percent, were planted on collective farms. In the same year State farms, owned and operated by the Government, planted 245,000 acres, or 5 percent, and independent peasant farmers (nonsocialized) planted 282,000 acres, or 6 percent.

COTTON IMPORTS—REDUCTION

For many years prior to 1929, the Soviet Union imported an average of about 500,000 bales of cotton each year for use in her textile mills. Since the new farming methods have been practiced, the importation of cotton from other countries has decreased. In 1932 the net imports were only 29,697 bales, and since that time they have averaged less than 100,000 bales.

In 1929, the Union of Soviet Socialist Republics bought 338,116 bales of cotton from the United States. Since that time there have been years in which not one bale was purchased by the Soviet Union from our country and in 1936 cotton imports from the United States were reported as 872 bales.

It is apparent that so long as the present production and consumption levels are maintained in the Soviet Union that there is little or no prospect of selling that country cotton grown in the United States, unless there should be a great increase made in per capita consumption in the Soviet Union. At the present time average consumption per person is from 10 to 12 pounds of cotton. There is little reason to assume that this rate of consumption will be materially changed in the years that lie immediately ahead.

OUTLOOK FOR THE FUTURE POSSIBLE INCREASED PRODUCTION

If one will refer to a map of the world and study the location of the Soviet Union with respect to the world's cotton belt and the other leading cotton-producing countries, it will be noted that practically the entire country lies north of the region considered adapted to cotton production. Already cotton is being grown in the Soviet Union in the latitude of Chicago.

Under the stimulus of the 5-year plans, cotton growing has been extended to the land north of the Black Sea and nearby regions. This is a section with short seasons and little rainfall, yet 1,278,000 acres were planted in cotton in these regions in 1937. The crop was grown without irrigation and the acre yields were very low.

It is said that Central Asia is a region of rivers without mouths, of lakes that have no outlets, of seas whose inflow is offset by evaporation and whose salty waters never reach the ocean. Here is located the most important cotton-growing region of the Soviet Union, in a country where the rainfall on the plains is less than 10 inches annually. Cotton is grown, of course, under irrigation.

Westward from Central Asia, across the Caspian Sea and south of the Caucasus Mountains, which mark the dividing line between Europe and Asia, lies Transcaucasia. Here, on the eastern side of the Syrian Mountains lies another important cotton region of the Soviet Union.

This, too, is a land of little rainfall where cotton is grown under irrigation.

A knowledge of the temperature and rainfall requirements of cotton would lead one to the conclusion that the acreage devoted to the growing of cotton in the Soviet Union cannot be greatly expanded. But it has been demonstrated that the Soviet Union need not look to other countries for the raw cotton used in her mills so long as a high level of production can be maintained.

SUMMARY

1. In 1938-39, the Soviet Union produced about four times as much cotton as in the 1910-14 period. The 1933 production represented about 97 percent of the cotton used by the textile mills of the Soviet Union.
2. The policy of the Soviet Union, as expressed in the 5-year plans, is to make the country self-sustaining in the matter of cotton production and cotton manufacturing.
3. The changes in the organization and methods of farming have been largely responsible for the progress that has been made in cotton production. The use of large machinery and the establishment of collective farms, along with Government supervision and control of farming programs, are the most important factors involved.
4. The cotton-growing regions of the Soviet Union are areas with little rainfall. Most of the cotton is grown under irrigation. It would appear that some of the new regions into which cotton has been extended are not favorable for cotton production as compared with other countries of the world where cotton is grown, yet remarkable progress has been made.
5. Russia and the Soviet Union formerly bought cotton grown in the United States. In 1929 the purchases of the Soviet Union amounted to 338,116 bales. But, if the production level can be maintained near that of 1938-39, it is not likely that the United States can sell cotton to the Soviet Union.



Cotton in the Soviet Union

1. A quality inspector in Central Asia.
2. A mechanical cotton picker.
3. Taking cotton to market.
4. Tons of seed cotton stacked.
5. Old and new transportation methods.

DO YOU KNOW: What the facts are relative to the view held by some persons that Brazil may soon become one of the most serious competitors of the United States in cotton production? Why the people of Brazil are turning their attention to cotton growing? How much longer the expansion of cotton acreage may continue? If Brazil is selling cotton to countries that formerly purchased the major portion of their imports from the United States?

COTTON POSSIBILITIES IN BRAZIL

Many students of the world cotton situation believe that Brazil will some day be the greatest competitor of the United States in the growing and perhaps in the spinning of cotton. Every citizen of our Nation, who appreciates the importance of cotton in our economic life, is interested in the facts upon which such an opinion is based.

To arrive at any conclusion concerning the cotton situation in Brazil, it is necessary to know something of the history of cotton growing in this country; the reasons for the changes that are taking place; and the possibilities for producing and selling larger crops.

A study of statistical reports reveals that from the beginning of the twentieth century until 1933-34 there was little change in the quantity of cotton produced in Brazil. The average normal crop was approximately 500,000 bales. But in 1933-34 a crop of more than 1,000,000 bales was produced. Four years later, in 1937-38, production reached a new record of 2,750,000 bales. Thus within a short space of time Brazil's cotton crop was increased to four times its normal size.

Why did this remarkable increase take place and how was it achieved?

A CHANGING AGRICULTURE

Brazil has a changing—an expanding—agriculture. It is a growing nation with vast possibilities for further expansion. It has great potential resources which, as yet, are largely undeveloped. It is, in a measure, a new world frontier.

To understand the changes that are taking place in the farming program of Brazil, it is necessary to know something of the country, its people, and the ways in which they have been making a living.

Brazil is a very large country, larger, in fact, than the United States. It has an area of about 3,300,000 square miles. It ranks fourth in size among the nations of the world. Even though it occupies a larger territory than the United States, it has far fewer people. In 1936 it had a population of less than 42,000,000 people.

The greatest needs of Brazil are people and capital. First many more people are needed to help develop the vast resources of the country. Then much additional capital is needed in order to finance properly this development. The population is increasing. The native people have large families; new settlers have been coming to Brazil from all parts of the world. This immigration, however, has declined sharply since about 1930, and in 1934 further immigration was strictly limited under a quota system. But under Brazil's new constitution each nationality has its immigration restricted to 2 percent per year of the number calculated for the previous 50 years.

Brazil is about as large, both in area and population as all the other countries of South America combined. So far as area is concerned the potential cotton land of Brazil is said to be greater in extent than the Cotton Belt of the United States.

COTTON IN SOUTHERN BRAZIL

Cotton is grown in two sections of Brazil—in the State of Sao Paulo and surrounding States in the southern portion, and in the States of the northeast. The two sections are distinctly different.

In Sao Paulo, cotton is planted in September, October, and November. The crop is harvested mainly from March to July. This seems very strange to those of us who live in North America, but it must be remembered that Sao Paulo is south of the Equator, where—from our point of view—the seasons are reversed, making their summer come during our winter months.

The soil of Sao Paulo ranges from a sandy clay to a clay loam, as it does in the eastern portion of our own Cotton Belt. The land is generally rich, and the yield is generally high. Of course, much of the land on which cotton has been planted in recent years is virgin soil. It was, until recently, covered with forests or brush. But the trees have been burned as the land was cleared to establish new cotton farms.

The cotton belt of southern Brazil has two seasons, a wet and a dry. While vegetation grows the year round, the fall and winter seasons are much drier than the spring and the summer months. During the growing season rainfall averages about 6 inches per month. As a rule cotton does not suffer from drought, but during some years the rains continue into the fall season, thus making picking difficult, and often resulting in a good deal of the crop being damaged or completely lost.

Sao Paulo is located in the richest and most progressive part of Brazil. This is the portion of that country which produces so much of the world's supply of coffee. It is significant that Brazil has

always produced crops for sale to other countries of the world. Like other new countries, it has been a producer of raw materials. Formerly a large percentage of Brazilian exports went to the United States and Europe and the remainder largely to the neighboring countries of Argentina and Uruguay. The United States still uses many Brazilian products, especially coffee.

About 20 percent of all Brazilian exports in 1936 was raw cotton. In 1936 Japan became an important customer for the first time. In 1937 over 4 percent of the value of Brazil's total exports went to Japan. In point of value, cotton in that year represented approximately 18.5 percent of total exports. The principal purchasers of



Brazilian cotton in that particular year were, in order of importance, Germany, Japan, and the United Kingdom.

Southern Brazil has a large area available for further expansion. And while transportation facilities in the interior of much of this great area were limited, many people moved into the country in the years following the abolition of slavery in 1888. In the prosperous decade of the 1920's many settlers came to Brazil principally from Italy, Portugal, Spain, and other European countries. Japanese immigration was quite important in the early part of the decade of the 1930's. It is said that 42 percent of the 1933-34 cotton crop of the State of Sao Paulo was grown by Japanese. About 50 percent of the total Brazilian cotton crop is grown in Sao Paulo.

The cotton grown in southern Brazil is much like that produced in the United States.

Brazil is encouraging cotton growing. In fact, the outstanding achievements in Sao Paulo have been directed and controlled by the State Government.

In Sao Paulo the State distributes planting seed from farms on which it is grown under State supervision. There is a compulsory seed law requiring all farmers to buy seed from the State. In this way the purity of selected varieties is maintained. A constant effort to improve both varieties and cultural methods is made through the experiment stations established by the Government. Gins are inspected and registered; samples of cotton from each bale are classed



at a central agency; grades are certified to the world trade by the Government; and a trading market for cotton has been established.

Brazil has for years experienced great difficulty in selling its enormous crops of coffee. The marketing of coffee has been controlled by the Government. One means of aiding in the solution of this serious problem was to interest the farmers of the country in other crops. Cotton seemed to offer the greatest possibilities for profitable production. The cotton exporters of Brazil were for a time given special consideration in the sale of foreign exchange derived from cotton exports. This, of course, tended to make cotton growing more attractive and profitable than other types of farming.

Farmers in the Sao Paulo district have been turning from coffee to cotton. In many cases cotton is reported to have been planted between the rows of coffee trees. But if coffee production again becomes more attractive, it will probably be given increased attention at the expense of this type of cotton farming.

COTTON IN NORTHEAST BRAZIL

Cotton is not a new crop in the northeastern part of Brazil. The cotton farmers of the United States who have felt that Brazil cannot grow cotton successfully in competition with the United States are perhaps not aware of the fact that as far back as the War between the States Brazil was shipping cotton to the United States and to foreign countries. This cotton came largely from northeastern Brazil.

In studying southern Brazil it was learned that cotton is planted in what is known as the autumn months in the United States; but something even more startling is to be learned with respect to northeastern Brazil—here a part of the cotton is grown on trees or large bushes which live from year to year and attain a height of about 8 or 9 feet.

In the United States, cotton seeds are planted in the spring; the plants grow during the summer, and die in the fall. The people of the United States think of cotton as an annual plant. But this is not true in all parts of the world. In those countries below the frost line, cotton may grow for years until the plant becomes a tree.

In northeastern Brazil tree cotton may live and produce crops for 15 years. Much of the cotton grown in northeastern Brazil has been mixed with annual varieties and has been allowed to deteriorate.

The people of northeastern Brazil have problems not found in the State of Sao Paulo. Perhaps the most important one is that they do not have a dependable supply of rainfall. In this particular part of Brazil the annual rainfall is more limited than in any other part of the country—from 18 to 40 inches per year. This is enough rainfall to produce a crop, but it may all come within a short space

of time and the remainder of the year be entirely without precipitation. In seasons of poor distribution of rainfall about 90 percent or more of the annual total falls during the first 3 months of the year. This distribution results in a very low yield.

Plans are under consideration for building more dams and reservoirs in this cotton-growing section of Brazil.

In recent years many persons living in northeastern Brazil have moved to the southern portion of the country. The Government wishes to stop this exodus, and they propose to do it by making the living and working conditions in the older part of the country more favorable.

The recent achievements in cotton production in Brazil may stimulate both sections to still greater efforts. Of this there can be no doubt, but indications point to the southern portions as the section where most of the future development and expansion is likely to take place.

REASONS FOR PROGRESS

Why has Brazil made such recent progress in the expansion of cotton production? There are many reasons, but three seem more important than all others:

(1) Brazil needed materials to exchange with other nations for manufactured articles; naturally, she turned to farming as the source of these commodities and it was again natural that the major crop should be cotton. The price of coffee—formerly the most important article of trade—was not favorable. More of it had been produced than the markets of the world would absorb at a profitable price. The price of cotton was, from Brazil's point of view, more favorable than that of coffee.

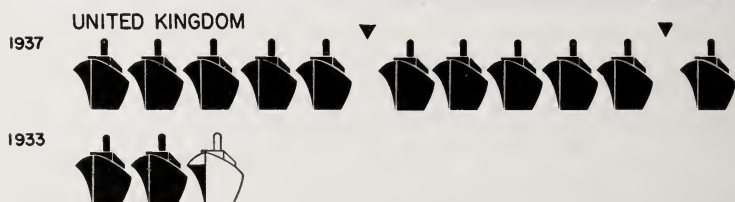
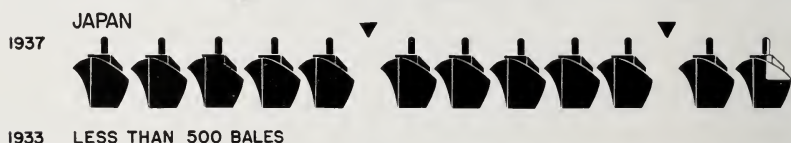
(2) The high tariff walls of the United States, and our own position as a creditor nation, caused other countries to turn their trade from America to those countries where they could exchange—on more even terms—those commodities they had for the ones they wanted.

(3) The growing population of Brazil—it has trebled since 1890—needed more income than could be provided from coffee, cocoa, and its other less important items of export trade. In other words, Brazil's population needed more cash crops and turned to cotton as one adapted to their country.

SELLING BRAZIL'S COTTON

What is done with the cotton crop of Brazil? The greater part of it is sold to other countries—mainly Great Britain, Germany, and Japan—all countries that were at one time listed as the best buyers of

BRAZIL'S COTTON EXPORTS TO SPECIFIED COUNTRIES 1933 AND 1937



EACH SHIP REPRESENTS 20,000 BALES OF EXPORTED COTTON



Cotton in Brazil

1. Clearing land for cotton.
2. New land for cotton.
3. Land being cleared for cotton.
4. Seed cotton.
5. A Brazilian bale.

cotton grown in the United States. In 1937, Brazil had 2,698,175 cotton spindles. Cotton manufacturing in Brazil has increased, but to a much less extent than her cotton production has expanded. Brazilian textile mills now consume 600,000 to 800,000 bales of cotton compared to less than 500,000 bales prior to 1933. The major portion of the cotton crop of Brazil is moving into the channels of world trade in ever increasing quantities. Two-thirds of the Brazilian cotton crop is exported.

SUMMARY

1. Cotton acreage and production are increasing very rapidly in Brazil, especially since 1933-34.
2. A new cotton-growing section is being developed in southern Brazil and new land cleared for cotton production.
3. Brazil has more land to put into cotton than we have in the United States, but both population and capital are limited, and transportation is not well developed.
4. The population of Brazil is small in relation to the land area but is increasing, and an effort is being made to bring farmers into the country from the other nations of the world.
5. The cotton produced in the State of Sao Paulo is similar in quality to that produced in the United States, and is being produced under encouragement of the Government.
6. The Government has, on occasions, offered export premiums to the cotton exporters of Brazil, which stimulates cotton growing rather than the production of coffee, and other crops. Coffee exports are controlled by the Government.
7. Cotton rather than coffee is expanding. The major part of the cotton grown in Brazil goes into the channels of world trade. Great Britain, Germany, and Japan are the largest buyers of Brazilian cotton.

DO YOU KNOW: *In how many countries cotton is grown? What percent of the world's crop is produced in countries other than those already considered? What those countries are? Where they are located? What the opportunity in each country for cotton production is? How much cotton they are producing? Whether or not it is likely that there may be an expansion of cotton production in these countries in the future?*

OTHER COTTON-PRODUCING COUNTRIES

Cotton is grown commercially in more than 60 countries of the world. Six of these countries produce more than nine-tenths of the world's crop. These countries, in the usual order of rank, are: (1) The United States, (2) India, (3) China, (4) the Union of Soviet Socialist Republics, (5) Egypt, and (6) Brazil. All the remaining countries of the world produce less cotton than the normal crop of the State of Texas.

In 1937-38 the cotton crop of the world was more than 38,600,000 bales. Of this total the minor cotton-producing countries produced about 3,000,000 bales, or about 8 percent. It might appear that the production of these 54 or more countries is unimportant. This seemingly is not a correct viewpoint, for if considered collectively, the crops grown in these countries materially affect the cotton trade of the world and, consequently, the possible outlets for fiber and seed produced in the United States. Individually, any of them, if present trends continue, may become major cotton-producing nations. Such a change in classification has already taken place in the case of Brazil. Other countries have possibilities that may eventually be realized.

If one wishes to secure a clearer understanding of the world's cotton situation, some study must be devoted to the more promising of what might be called the minor cotton-producing countries. They will be considered somewhat in order of their relative standing as cotton-producing nations.

PERU

Peru is a relatively small country which lies on the west coast of South America opposite Brazil. It is almost entirely mountainous with a fringe of arid coastal plain between the mountains and the Pacific Ocean.

This nation is near the Equator. Along river valleys and lowlands, where cotton is grown, the country may be classified as always hot.

There are winds and very high mountains which temper the heat of the valleys and the lowlands.

Cotton has been grown in Peru for many centuries. The size of the commercial crop produced has increased rather consistently for several decades. In 1909-10 a crop of 120,000 bales was made; 149,000 bales were grown in 1919-20. In 1937-38 a record crop of more than 415,000 bales was produced, but there was a slight decline from this peak the following year.

Acre yields are very high in Peru. Cotton is grown under irrigation. The arid valleys do not receive enough rainfall to produce profitable crops, but mountain streams furnish the necessary supply of water. In 1920-21 the yield of lint cotton per acre was 328 pounds. An average yield of 511 pounds of lint per acre was made in 1937-38, which, in a measure, accounts for the record production of that year. Peruvian cotton ranks very high in quality.

Statements have been made concerning the tree cotton of Brazil. In Peru cotton of the same type is found. It is never killed by frost. But the production of tree cotton is discouraged, and in some regions it is prohibited because it is less profitable.

Guano, a natural fertilizer deposited by sea birds on the islands off the coast of Peru, is used in large quantities in that country's cotton production. The large plantation system of farming predominates in this country. Many of the estates are equipped with gins and

A cotton field in Peru



presses of their own. The cotton is concentrated on the beaches where it is picked up by coastwise steamers.

About 85 to 90 percent of the crop of Peru is exported. It is sold, in the main, to Great Britain, Germany, Japan, Belgium, and France.



ARGENTINA

Argentina occupies the greater portion of the lower part of the continent of South America. It is a vast country, stretching over 2,000 miles from north to south. The people living in this nation are, for the most part, of European birth or descent. Buenos Aires, the largest city of South America and the fourth largest in the Western Hemisphere, is the capital. In this city about one-fifth of the total population of the country resides.

The country of Argentina may be divided into three parts with respect to physical and climatic characteristics. These characteristics largely determine the agricultural possibilities of the respective regions.

In the southern part of the continent of South America is a part of Argentina known as Patagonia. This is a region of little rainfall devoted almost entirely to the production of sheep. It is too dry for farming, and the grass is too poor for cattle.

North of Patagonia lies the great plain known as the Pampa. This region, which occupies about one-fourth of Argentina's land area, is devoted to diversified farming including the growing of wheat and corn and the production of cattle and sheep.

The remaining part of Argentina is known as El Chaco. It extends across the northern part of the Republic. In this section the major portion of the cotton crop of the country is produced. This region is a low plain, partly grassland and partly forest. Its location makes it warm throughout the year. It has a rainy season and a dry season. During the dry season, which comes in the winter, so little rain falls that the grass withers and turns brown. During the rainy season the rivers overflow their banks and flood large stretches of land.

Cotton is a relatively new commercial crop of importance in Argentina. During what is often spoken of in the United States as the base period for making agricultural calculations, 1910-14, the cotton crop of Argentina averaged only about 2,000 bales annually. For the 1938-39 season, it is estimated that 251,000 bales were grown.

The production of cotton textiles is one of the most important industries in Argentina. It is confined largely to wide sheeting and heavy goods, with a small but increasing output of low-quality print goods. In 1937, there were 30 weaving mills with a total of 320,000 spindles producing cotton yarns.

Approximately one-third of the crop of 1938-39 was exported. Germany was the largest buyer of Argentina's cotton in this particular year, taking 77,000 out of a total of approximately 100,000 bales.

Free land is the most important factor contributing to the growth of the cotton industry in Argentina. El Chaco is largely undevel-

oped. A substantial part of the Argentine cotton is grown by squatters on public land, and, of course, such persons pay no rent or taxes.

The outstanding difficulties which may limit further expansion of the cotton industry in Argentina are (1) limited and unsatisfactory agricultural credit, (2) inadequate transportation facilities, and (3) frequent droughts and locust invasions. Insect pests are very destructive in periods of excessive rainfall. Experiment stations have been established in the principal cotton-producing sections for the purpose of aiding the increasing number of cotton growers in the Republic.

What are the prospects for further expansion in cotton production in Argentina?

Various estimates place the potential cotton land in Argentina at more than 50,000,000 acres so far as climate and soil possibilities are concerned. Other factors must be considered, however. Among the limiting factors labor and capital are the most important. If the price of cotton were sufficiently high, it is quite likely that these limitations could be overcome. After a survey made in 1937, the National Cotton Board of Argentina expressed the opinion that up to 1947 the total land area devoted to cotton production was not likely to exceed 2,500,000 acres. Such an expansion, however, would make possible a crop two and one-half times as large as the crop of 1938-39.



MEXICO

When Cortez landed in Mexico many years ago, he found the Indians growing cotton.

In modern times cotton has been one of the important crops of Mexico. Acreage and production have fluctuated widely since 1910, but a sharp upward trend was started in 1935-36.

For the most part Mexico is a country of little rainfall. Approximately four-fifths of the possible cropland is located in regions classified as semiarid. Practically all the cotton produced in Mexico is grown under irrigation. This accounts for the relatively large yields per acre, which for the 5-year period 1910-14 averaged 358 pounds of lint.

With the exception of some long-staple cotton produced in Mexicali, most of the cotton grown in Mexico is of the American upland type. Under normal weather conditions, quality and staple lengths compare favorably with those of cotton grown in the United States.

For the 5-year period 1920-25 the average cotton crop of Mexico was 180,000 bales. With fluctuations from year to year, there has been a gradual upward trend from that time until a record crop of 395,000 bales was produced in 1936-37.

The greater portion of the Mexican crop is used by the domestic mills, but each year a part of the crop is sold to other countries. The bulk of Mexico's raw cotton exports goes to Japan, United States, and Germany. That part which comes to the United States is reexported.

The Federal Government of Mexico has aided the cotton industry in many ways. Most important of these aids are the construction of irrigation works and the establishment of a protective tariff policy.

The National Irrigation Commission of Mexico was established in 1926. Little work was done in land irrigation until 1934. Since that date great progress has been made. It is estimated that 700,000 acres have been added, through the work of the Commission, to the 4,000,000 acres of land previously under irrigation. How much additional land may be irrigated is problematical, since the possible water supply is limited. In fact, some of the land now under irrigation does not secure an adequate water supply in years of drought.

Under the tariff policy of the country, the domestic price of cotton in Mexico is from \$5 to \$10 per bale higher than the price of the same grade and staple of cotton in the United States. So great is the advantage of the growers under the policy of the Federal Government that they have found it profitable to hold cotton off the market rather than export it in years when it could not be sold for consumption in domestic mills.



An irrigated valley in Mexico

The cotton textile industry has grown steadily under the protective tariff that keeps out all raw cotton imports, except small quantities of Egyptian long staple, not grown in sufficient amounts in Mexico.

It is difficult to predict the future possibilities for cotton production in Mexico. If large sums of money were made available for the construction of vast irrigation works, the acreage might be increased for many years. Without such capital outlay for additional irrigation projects, no material expansion in cotton planting may be anticipated for the reason that Mexico is importing food crops to feed her industrial population. With large acre yields of cotton this might prove to be a wise national policy, but due to the ravages of soil erosion and other losses of soil fertility, yields per acre have declined in recent years. It must be recognized, however, that since 1935-36 Mexico has established a new and a higher level in cotton production.

ANGLO-EGYPTIAN SUDAN

The Anglo-Egyptian Sudan is in Africa. It is bounded on the north by Egypt and on the south by Uganda, Kenya, and the Belgian Congo—all of which are cotton-growing countries.

In 1920-21 the Sudan produced 26,000 bales of cotton. In 1936-37 it produced 268,000 bales—an increase in the annual crop in 17 years of over 200,000 bales. Acre yields have varied widely, for instance, in 1909-10 the yield was 213 pounds per acre; in 1918-19 it was only



Sudan cotton going to market

90 pounds; and in 1936-37 it was about 270 pounds. In the Gezira area, which is the leading cotton-producing area, the yield of cotton in 1914-15 was 505 pounds per acre.

The Sudan lies within the Torrid Zone and has a hot climate. More than three-fourths of the country is rocky, sandy desert, or worthless swamp. Practically all of the northern, eastern, and western areas are deserts where rainfall is very scant, and a large section of the southern area is swampy and otherwise unfit for agriculture. The desert and semiarid desert areas are subject to severe sand storms, which come usually in the spring and early summer, and make living conditions almost unbearable for Europeans. Moreover, the extreme heat often reaches a monthly average of 90° F.

As the name implies the Anglo-Egyptian Sudan belongs jointly to Great Britain and Egypt. It is administered by a governor general appointed by Egypt with the assent of Great Britain. The British and the Egyptian flags fly together.

The British influence, as in other countries, seeks to encourage cotton production. Local conditions, however, are not favorable for marked expansion in the years that lie immediately ahead.

TURKEY

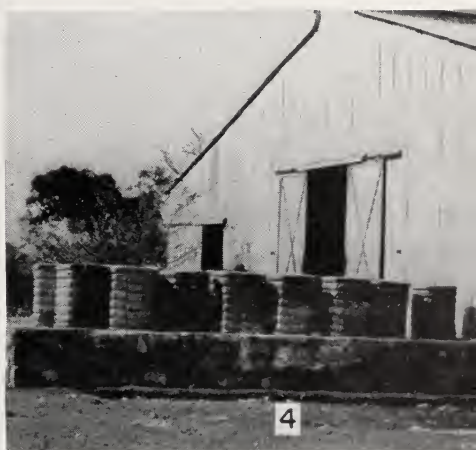
The Government of Turkey has undertaken to stimulate organized planning and other progressive steps leading to an improvement of economic conditions.

Legislation dealing with cotton production has been enacted. One objective of the legislation pertaining to cotton growing is that of



Cotton in the Sudan

1. A cotton grower's home in the Nubian Mountains.
 2. Cultivating cotton.
 3. A cotton grower's home in the Gezira District.
 4. Ginned cotton.
 5. Seed cotton waiting at the gin.
 6. Seed cotton bag.
-



improving the quality of the staple produced. American varieties have been introduced. Already some of those most popular in the United States, such as Acala and Cleveland, are being grown. These varieties are quite satisfactory.

The Government provides for the inspection and regulation of gins. The mixing of varieties is prohibited. Equipment is provided for the treating of planting seed, so that diseases may be controlled. The plan embodies many of those practices recommended for the improvement of cotton production in America, and it is said that the program is meeting with promising results.

Building textile mills is a part of the plan. During the first year that the plan was in operation, 1936-37, three mills were erected and put into operation. These are rather large mills, the one known as the Nazilli Textile Combinat having 29,500 spindles.



Turkey is located in the world's cotton belt. It is between 36° and 42° north latitude. Only a small part of the country, however, is adapted to cotton production. But progress is being made. From an average of less than 89,000 bales for the 5-year period beginning in 1925, production has been increased until a crop of 306,000 bales was harvested in 1938-39.

UGANDA

Uganda is a British Protectorate in the extreme northwest portion of British East Africa, and it lies south of the Anglo-Egyptian Sudan.

That the country is adapted to cotton growing is shown by the fact that the acreage has increased from 25,000 in 1909-10 to 1,759,000 in 1937-38.

One of the limiting factors in the further development of cotton culture in this country is the attitude of the people who live there.

The population of Uganda is about 3,600,000 persons of whom all but about 15,000 are natives.

About 850,000 of the natives belong to the Buganda tribe. This tribe has attained a higher degree of civilization than any other African tribe. In fact, it is said that all of the tribes of the country seem to be more intelligent than those to the north and west.

These people have begun to want articles which they can get from Europe. They want clothing, furniture, bicycles, sewing machines, and other things which can be secured in exchange for cotton. The extent to which cotton production is increased depends upon how badly these people want the things which Great Britain and other countries wish to exchange for cotton. This may seem to be a little strange on first thought, but reflection reveals that this is the motivating factor with all people. The only difference is that the wants of some people are more extensive than the wants of others.

SUMMARY

1. There are about 60 countries in the world in which cotton is grown.
2. Six countries—(1) United States, (2) India, (3) China, (4) the Union of Soviet Socialist Republics, (5) Egypt, and (6) Brazil—produce about 90 percent of the world's supply.
3. In addition to the six countries previously listed, other important producing countries are (1) Peru, (2) Argentina, (3) Mexico, (4) Anglo-Egyptian Sudan, (5) Turkey, and (6) Uganda.
4. In all 12 of the countries the trend in cotton is upward, with the exception of the United States.

COTTON PRODUCTION IN SPECIFIED COUNTRIES

PERU

1920-21



1932-33



1937-38



ARGENTINA

1920-21



1932-33



1937-38



MEXICO

1920-21 (DATA NOT AVAILABLE)

1932-33



1937-38



EACH SYMBOL REPRESENTS 20,000 BALES

COTTON PRODUCTION IN SPECIFIED COUNTRIES

SUDAN

1920-21



1932-33



1937-38



TURKEY

1920-21 (DATA NOT AVAILABLE)

1932-33



1937-38



UGANDA

1920-21



1932-33



1937-38



EACH SYMBOL REPRESENTS 20,000 BALES

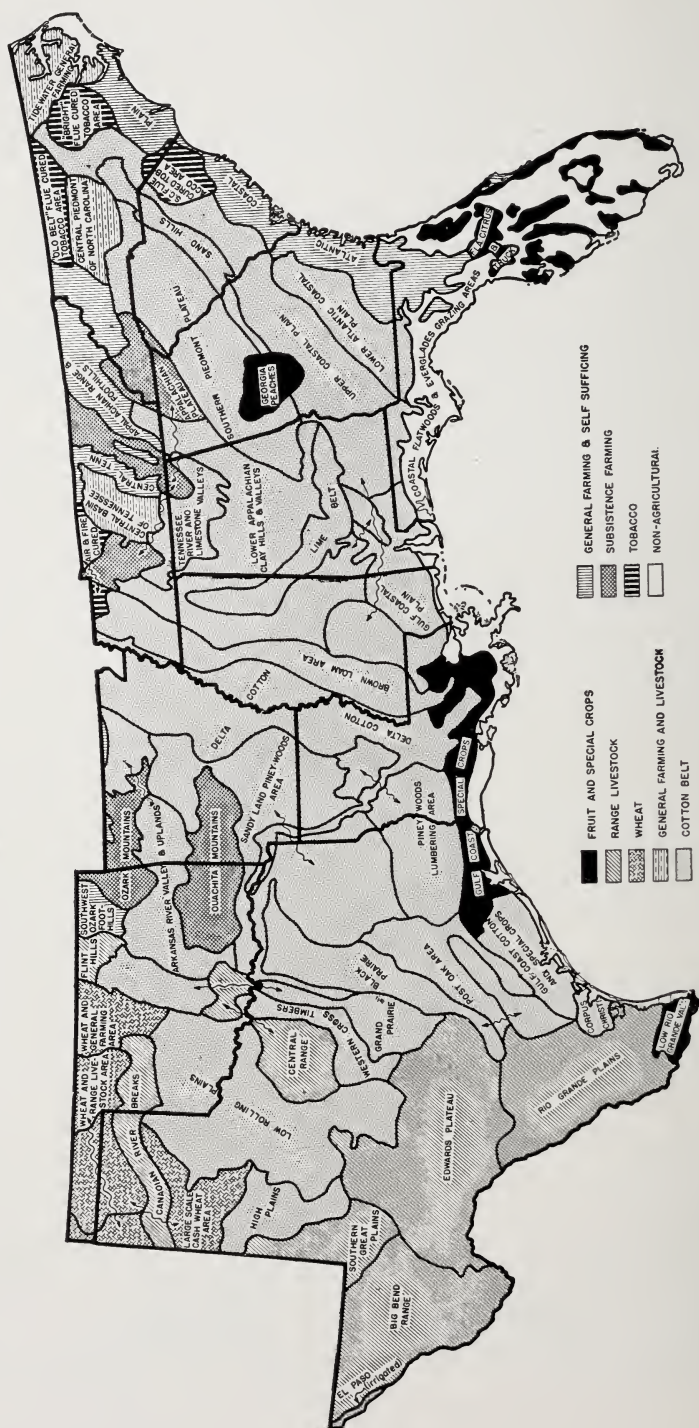
PART THREE . .

COTTON *in*

the UNITED STATES



TYPES OF FARMING IN THE PRINCIPAL COTTON STATES



DO YOU KNOW: Where cotton is grown in the United States? What the soil and climatic conditions are in the Cotton Belt? The principal regions of the Cotton Belt? What shifts have taken place in the regions of major production? What State leads in cotton production? In what part of the Cotton Belt the major part of the crop of the United States is produced?

OUR COTTON BELT

In the southern half of the United States is found the largest continuous area of land in the world used in the production of cotton. Formerly this region produced about 60 percent of the world's production. This is a land of hot-summer and cool-winter temperatures.

The term "Cotton Belt" as generally used by the people of the United States refers to that part of the country which extends, roughly, from southeastern Virginia to western Texas and up the Mississippi River to Cairo, Ill. The belt is about 1,600 miles long and from 125 to 500 miles wide. The average width is about 300 miles. It is an area of specialized cotton production, interspersed with general and other types of farming. It extends from the Atlantic Ocean through most of North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Arkansas, part of Florida, most of Tennessee, and practically all of Texas and Oklahoma.

Smaller quantities of cotton are raised in the warmer sections of other States bordering the Cotton Belt on the north. Cotton is raised under irrigation in parts of Texas, New Mexico, the Salt River Valley in Arizona, and in several valleys in California.

SIZE OF THE COTTON BELT

It is estimated that there are about 700,000 square miles of land in the Cotton Belt, which is about 468,000,000 acres. Millions of these acres are devoted to the growing of food and feed crops, including pastures. In several of the States in the Southeast about one-half the land area is covered with trees. Much of the land is too poor to produce crops profitably, and a portion of it does not receive sufficient rainfall to warrant its use in the growing of row crops. The acreage devoted to the production of cotton may be expanded or reduced materially as conditions warrant, but only a part of the total area could under any circumstances be used for growing cotton.

The largest number of acres ever planted to cotton in the United States was 45,968,000. This record was established in 1925.

YIELD OF LINT COTTON PER ACRE IN MAJOR COTTON STATES 5-YEAR AVERAGE— 1934-38

NORTH CAROLINA



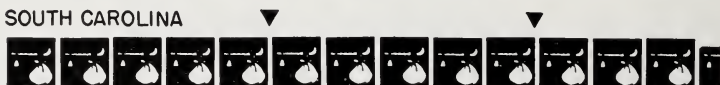
MISSISSIPPI



TENNESSEE



SOUTH CAROLINA



LOUISIANA



ARKANSAS



ALABAMA



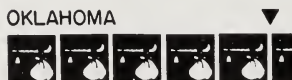
GEORGIA



TEXAS

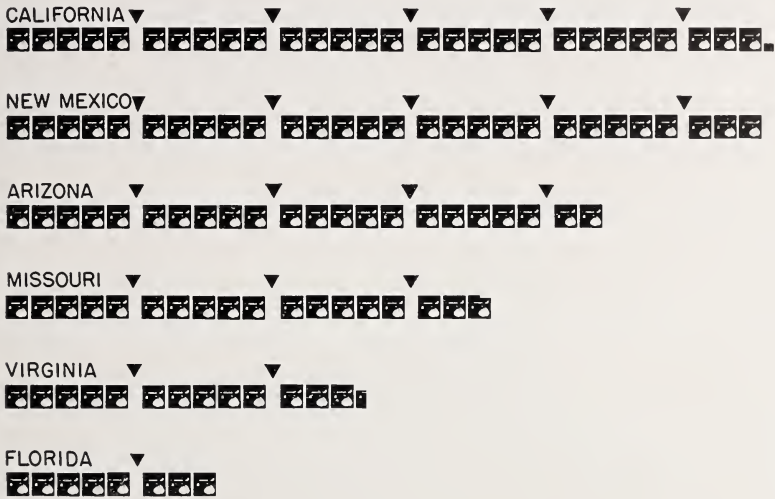


OKLAHOMA



EACH SYMBOL REPRESENTS 20 POUNDS OF COTTON

YIELD OF LINT COTTON PER ACRE IN MINOR COTTON STATES 5-YEAR AVERAGE— 1934-38



EACH SYMBOL REPRESENTS 20 POUNDS OF COTTON

NATURAL CONDITIONS

The natural conditions to be considered in cotton production are soil, climate, topography, and natural advantages for transportation. Climate includes both temperature and rainfall.

Fertility of soil is judged by the yield of crops grown on it. It has been found that cotton will grow well on almost any well-drained soils in the South, but certain soil types are naturally more productive than others. The most productive soils for cotton in a normal season are the flat—or nearly flat—dark-colored loams, particularly those rich in lime such as are found in the black prairie lands of Texas; the red, yellow, or brown soils of the Piedmont and the Upper Coastal Plain; and the well-drained bottom lands of the Mississippi and other rivers.

In the past the cotton acreage has been increased by bringing new land into production as the old land became eroded and less productive; hence, there are hundreds of thousands of acres of poor, eroded land in the Cotton Belt that should be in pastures or forests rather than in cultivated crops. One of the greatest problems of the South is the conservation of the soil. Rotation of crops is needed to con-

serve the fertility on all cropland, but rotations are not generally followed in the South. The continuous growing of cotton on some lands has resulted in a decrease in acre yields. Various types of commercial fertilizers are used to overcome soil deficiencies in many parts of the Eastern Cotton Belt. In fact, this section of the country uses more than one-half of all the commercial plant food sold in the United States.

In spite of the fact that soil conditions determine to a large extent the amount of acreage devoted to cotton in a given area, the climatic factors determine almost entirely the outer boundaries of cotton production. The Cotton Belt has an average summer temperature of 77° F. along the northern boundary. This gives favorable growing conditions. The cotton plant usually requires about 200 days to mature, but varieties have been developed which require only 180 days.

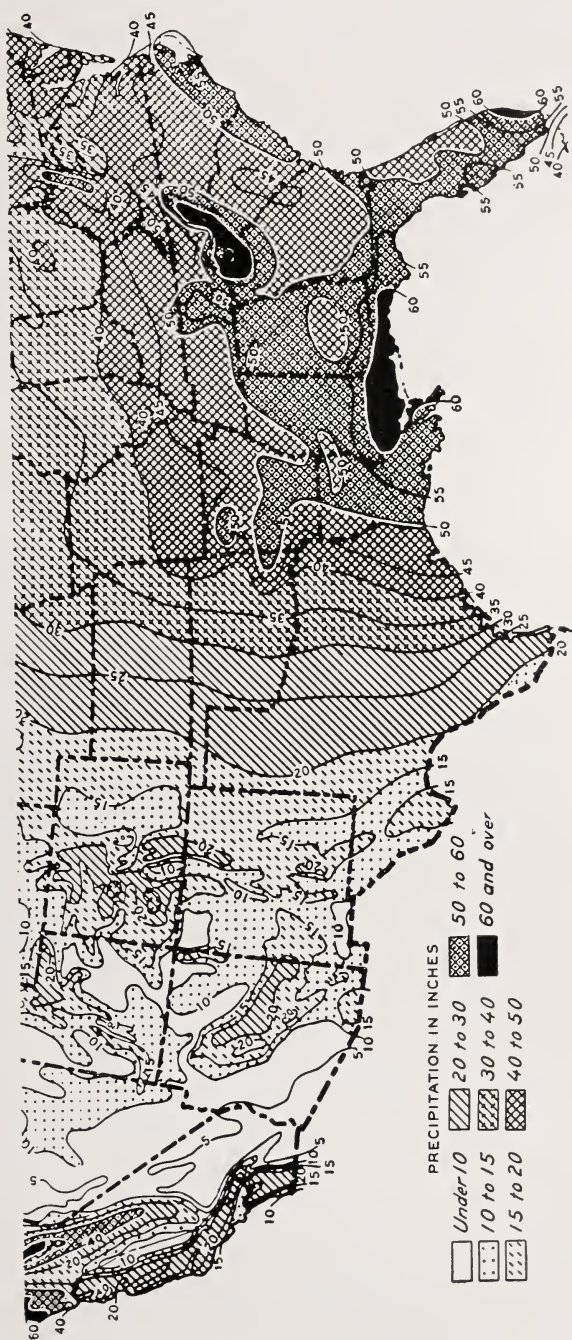
The annual precipitation, which includes rain, hail, sleet, and snow, varies from 40 to 60 inches in the eastern and central parts of the Cotton Belt. In the western part, which is located in Texas and Oklahoma, it may be as low as 20 inches. The western border is a region with 7 to 8 inches of summer rainfall. If the rainfall is less than this minimum requirement then the land must be irrigated before cotton can be grown. Rainfall is favorably distributed for cotton growing in the South. Most of the rains come in the late winter, early spring, and summer. During the fall, which is the maturing and picking season, the smallest amount of rain of any period of the year is received.

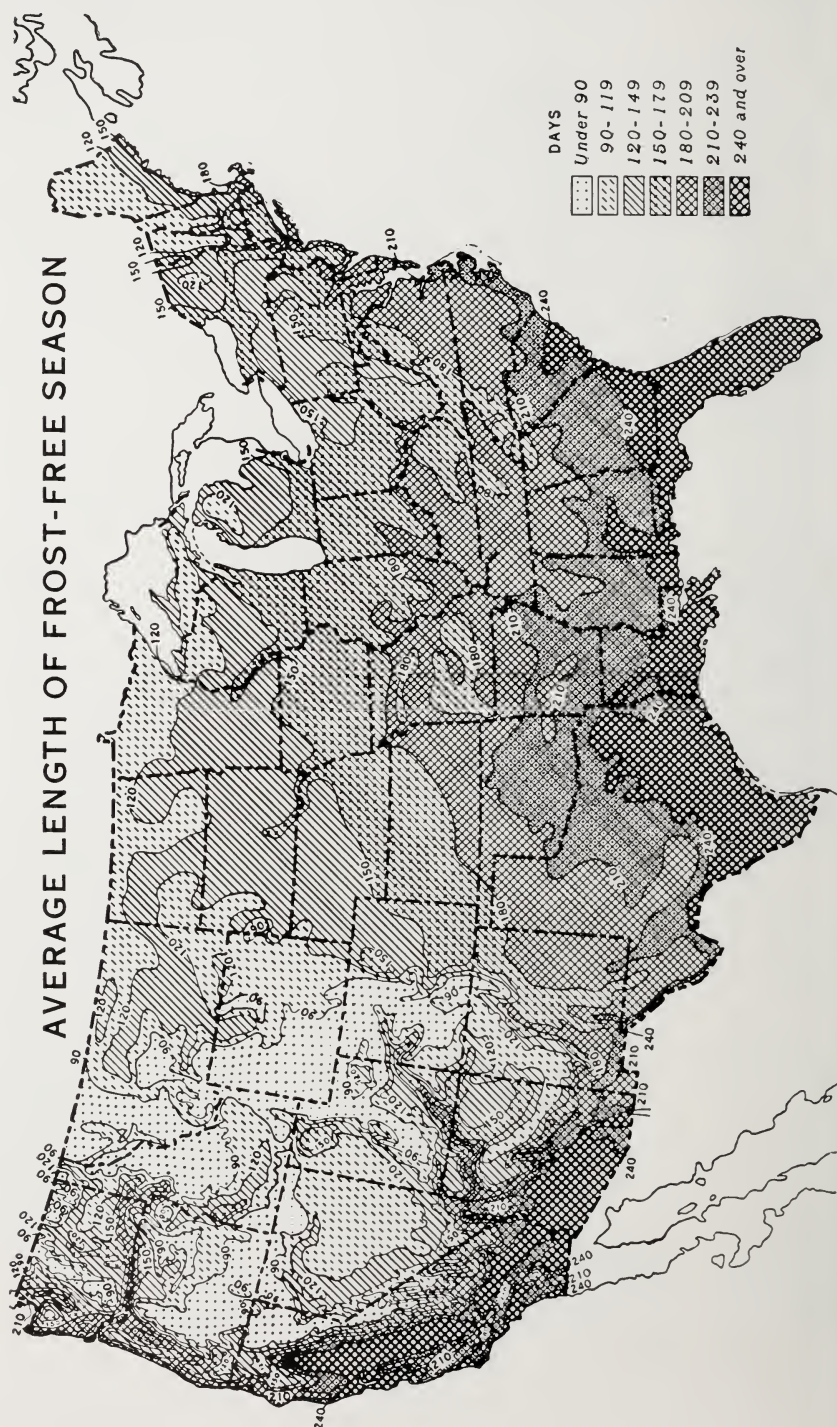
COTTON REGIONS IN UNITED STATES

Climatic conditions vary widely in the Cotton Belt. The entire area may, in general, be divided into three parts: (1) The humid region, or original forest lands; (2) the subhumid, or grasslands; and (3) the arid, or dry lands.

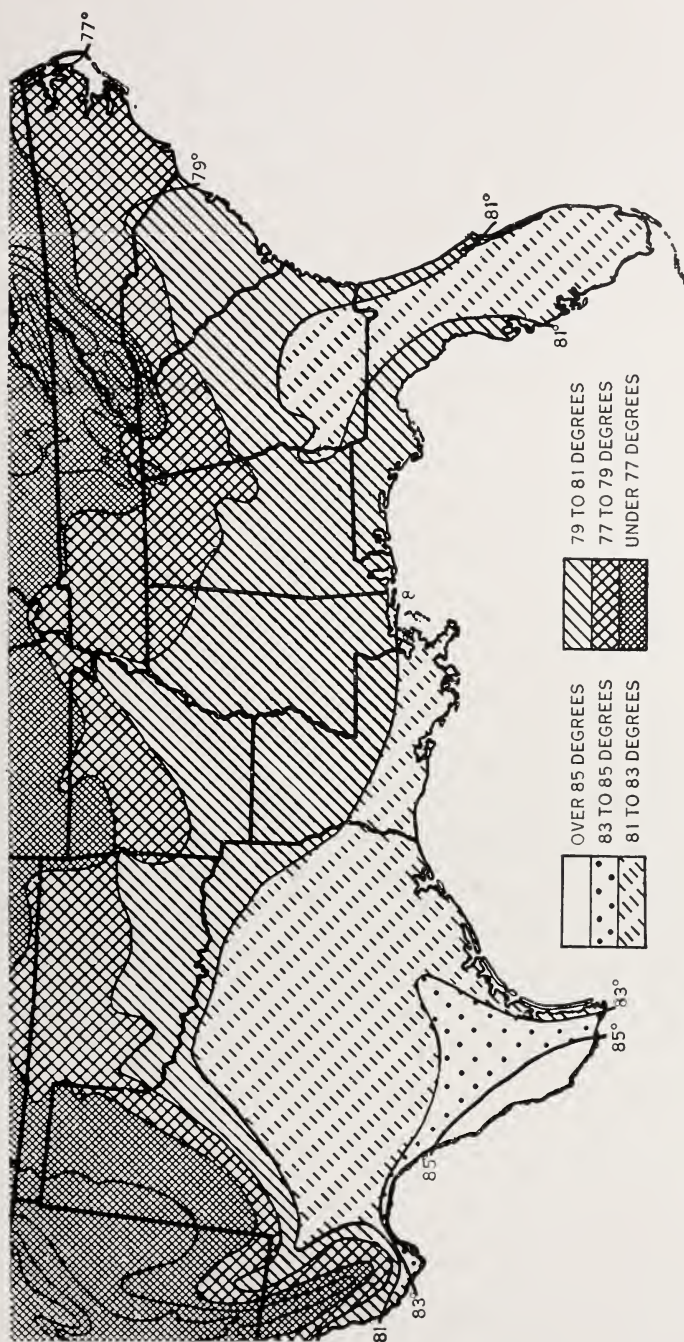
Humid region.—The States of the Cotton Belt, which have the largest annual rainfall, were originally covered with forests. These forest lands extended from Virginia to Central Texas. All forest lands naturally become covered with leaf mold. This decaying vegetable matter helps to make an acid condition of the soil. In turn the acid condition is conducive to the dissolving of minerals in the soil and the abundant rains leach the plant food away. This continuous weathering process and leaching takes away from the surface much of the plant food required for the growing of crops. After the forests were cut the processes of chemical change and leaching went on much more rapidly, so that maintaining soil fertility is one of the greatest and most serious problems of the cotton grower in this section of the Cotton Belt.

ANNUAL RAINFALL IN THE COTTON BELT OF THE UNITED STATES





AVERAGE SUMMER TEMPERATURES IN THE SOUTH



Subhumid region.—Most of the area west of the original forest lands may be characterized as the prairies, or original grasslands of the Cotton Belt. Over these prairies the grass type of vegetation has grown for centuries and has had a tendency to bring the plant food elements from the lower levels of the soil toward its surface. That is to say, the roots of the grasses and legumes take in the plant food elements from the soil and, as the grass decays, the plant food elements are deposited in the surface soil layers. As has been seen, the grassland region has less rainfall than the eastern woodland region. This lower rainfall tends to lessen the leaching of plant food from the soil, but it also tends to increase the hazards of cotton production in this region. In fact, the conservation of rainfall is one of the most important problems of cotton production in many of the grassland areas of northwestern Texas and southwestern Oklahoma.

Arid region.—In the arid region west and south of the grasslands, including southwestern Texas, parts of New Mexico, Arizona, and southern California, cotton is grown only in irrigated valleys. These valleys are usually fertile, but the supply of water for irrigation is, at present, limited. Water for irrigation, therefore, is the main factor limiting cotton growing in this region. However, competition from other crops is also a factor in determining the area that may be devoted to cotton.

SHIFTS IN COTTON PRODUCTION

The Jamestown colonists planted cotton in their gardens in 1607. Of course, it did not become an important crop until after the invention of the cotton gin. Naturally, the first large plantings were in the eastern portion of what we know as the Cotton Belt, for that was the only section of the country in which the colonists were living. As the country developed, cotton production increased.

By 1840 large numbers of cotton growers had moved westward into the fertile valleys of Alabama, Mississippi, and Louisiana. Cotton production was being expanded very rapidly. Between 1849 and 1859 production doubled.

The annexation of Texas in 1845 added greatly to the extent of the Cotton Belt.

The building of railroads was an important factor in opening up new territory.

During the War between the States cotton production was sharply curtailed in this country. It was not until 1877 that the production again equaled that for 1861.

Between 1877 and 1894 there was a great increase in the cotton crop of the United States. Production had increased in all the older cotton-growing areas, but the greatest relative increase had

occurred in Texas—the newest cotton-growing State. For nearly 50 years Texas has been the leading cotton-growing State of the Nation. During the 10-year period 1927–36, for example, Texas produced about 30 percent of the cotton of the United States.

There have been many changes in the areas in which cotton is grown, both within the Cotton Belt as a whole and within the States in the belt. The percentage of the crop grown west of the Mississippi River has tended to increase. In the period 1909–18, the States west of the river produced 46 percent of the crop of the United States; they produced 56 percent from 1919 to 1928; and 55 percent from 1929 to 1938.

Throughout the Cotton Belt it is a subject for debate as to which part of the area is more favorably adapted to cotton growing. It is claimed that the cheapest cost of production per pound of lint is attained in those sections of relatively small fields, intense cultivation, large fertilizer applications, and hand-picked crops. On the other hand, it is said that the economic advantage lies with the sections where large level tracts of land make possible the extensive use of improved farm machinery.

SUMMARY

1. The Cotton Belt of the United States is the largest continuous area of land in the world used for cotton production.
2. The Cotton Belt of the United States extends from Virginia to Texas and up the Mississippi River to Cairo, Ill. It is about 1,600 miles long and, on the average, about 300 miles wide.
3. The Cotton Belt may be divided into three sections: (1) The *humid region*, or the part formerly covered with forests; (2) the *subhumid region*, or the part formerly covered with grass; and (3) the *arid region*, where irrigation must be practiced.
4. In general, the Cotton Belt has tended to move westward. The States west of the Mississippi River now produce more than 50 percent of the cotton crop of the United States.
5. Each section of the Cotton Belt has some advantages not found in the others.

DO YOU KNOW: Why so many hours are required to grow a crop of cotton? Why so little large machinery is used in cotton production? What methods of harvesting are practiced? To what extent the mechanical cotton picker has been a success? What changes are likely to take place in cotton production in the future? What social problems are involved in cotton growing? What the individual grower can do to decrease the cost of production and to increase the value of his product?

IMPROVING PRODUCTION METHODS

The typical farmer of the United States is in many respects the most efficient producer of agricultural commodities in the world. There are other countries in which larger acre yields are made, but few in which the production per worker is so great.

Power is the secret of the American farmer's efficiency—power plus the use of the large labor-saving machinery.

One hundred years ago in the United States, for example, a total of about 58 hours was required to produce an acre of wheat. Of course, it is understood that wheat was grown primarily at that time in eastern United States. Recently this total has been reduced to about 7 hours, and in some areas in which the growing of wheat is highly mechanized the total is as low as 2 or 3 hours per acre.

HOURS OF LABOR IN COTTON PRODUCTION

In cotton production modern machinery has never been used to such a marked degree as in growing and harvesting wheat. The Yearbook of the United States Department of Agriculture for 1921 contains the following statement: "With one mule a man can plow, chop, and hoe from 10 to 20 acres, from which 5 to 10 bales of cotton can be produced, and this is ordinarily all one family can pick. Therefore, one-mule implements are used over the greater portion of the eastern part of the Cotton Belt."

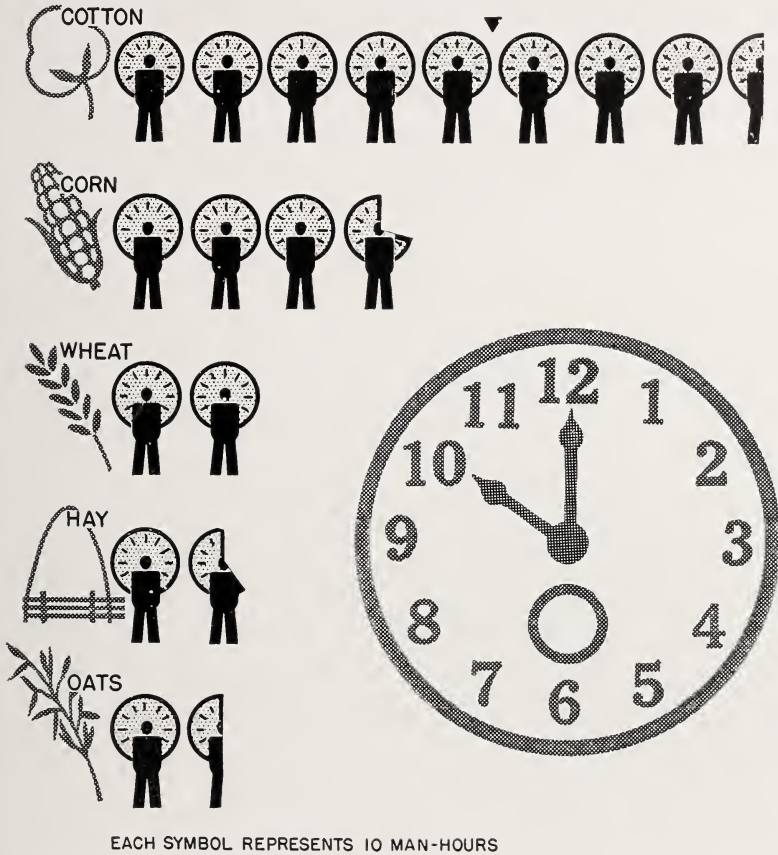
In recent years the thoughts of our more progressive cotton growers have turned to ways in which the number of man-hours required to produce the crop may be reduced.

Cotton requires more man-hours of labor than any field crop grown generally in the South. Tobacco, sugarcane, and certain truck crops require more hours of labor per acre than cotton, but these crops are not generally grown throughout the Cotton Belt. Studies made by the Bureau of Agricultural Economics indicate that it requires in the ten major cotton-producing States an average of about 85 hours of man-labor to grow, harvest, and market 1 acre of cotton as con-

trusted with 37 hours for corn, 20 for wheat, 15 for oats, and 16 for hay.

When these hours are distributed among the jobs involved in cotton growing, it is found that the largest number is required for chopping

MAN-HOURS REQUIRED TO PRODUCE AND MARKET ONE ACRE OF SPECIFIED CROPS IN TEN MAJOR COTTON-PRODUCING STATES



and picking. These, then, are the tasks which must be attacked if the hours of labor in cotton growing are to be reduced.

CHOPPING COTTON

Has any advance been made to lessen the hours of labor in chopping cotton? For years all cotton-planting machines distributed a stream of seed in the row. After the plants came through the surface

of the soil, they were thinned—with a hoe—to the stand desired. Now, however, it is recommended that seed be delinted before planting, that the seed be tested for germination, and that a planter be used which will plant the seed at the proper distance apart to secure the spacing desired. In this way many hours of hand labor may be eliminated.

Delinting is usually done in one of the three following ways: (1) By subjecting the seed to the fumes of certain gases, (2) by placing them in concentrated sulfuric acid, or (3) by passing them through delinting machines.

Some advantages of delinting seed are that they plant more uniformly, germinate sooner when the supply of moisture is limited, and, if delinted with acid, some degree of disease control results.

The disadvantages of delinting include the added cost of preparing seed for planting and the fact that the seeds are more likely to rot if cold, wet weather follows immediately after planting. Delinted seeds heat easily if left in bags, which means that greater care must be given planting seed if this practice is followed.

In spite of these disadvantages, the delinting of planting seed is becoming more popular and seems to be a forward step in cotton production methods.

A much more difficult task is involved in improving methods of harvesting the crop.

HARVESTING METHODS

So far as labor is concerned, harvesting has always been the most expensive operation in growing cotton. The chief reason for this is that cotton has always been picked by hand.

More than one-third of all the hours of human labor required to produce a cotton crop are normally used in the job of harvesting the seed cotton.

The increased competition with American cotton that has resulted from the larger crops grown in foreign countries, has led to serious consideration of ways in which the production cost per pound can be reduced. Any improved methods which will reduce the hand work, and consequently the labor requirements, will reduce costs. These improved methods will also make it possible for one worker to increase the number of acres of the crop that he can produce, through which a larger gross income may be realized. Naturally, a consideration of such methods has centered on ways of harvesting the seed cotton.

While picking by hand is still the accepted means of gathering cotton in the Southeast and in most other sections, harvesting by more rapid methods in some sections has been on the increase. In

some districts cotton is snapped by hand workers; in others it is stripped with implements designed for such work; and more recently several mechanical pickers have been used in an experimental way.

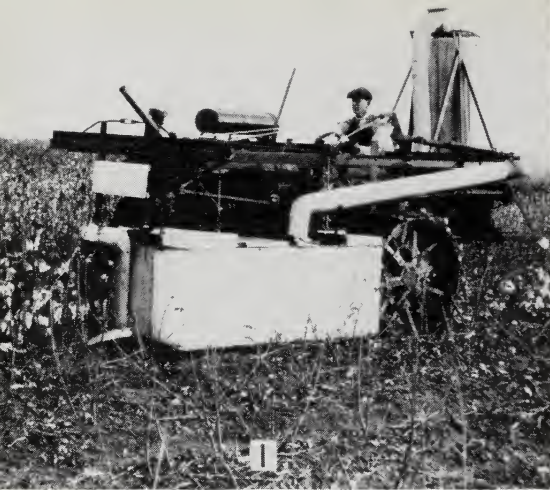
Many attempts have been made to invent a machine for picking cotton. Hundreds of patents have been granted by the United States Patent Office to inventors of mechanical cotton pickers and parts for cotton-picking machines. Most of these machines have been of little practical value. It is difficult to invent an efficient and economical machine for picking cotton because of a number of conditions peculiar to cotton, among which are (1) the number of bolls on a plant; (2) the distribution of the bolls; (3) the tendency for leaves and other trash to become mixed with the lint; (4) the difficulty of removing the lint from the burs; and (5) the fact that not all the bolls are ready for harvesting at the same time.

Mechanical cotton-picking machines are available through commercial concerns for those who wish to buy them. But the leading manufacturers of agricultural implements and machinery are making no effort to rush into the market with a cotton-picking machine. Many of these manufacturers, however, have experimental models, which they are testing and improving. They hope to have an efficient machine to sell when there is a demand for it.

There are several reasons why the cotton growers themselves are not anxious to secure mechanical cotton-picking machines quickly. One important reason is that labor supply for picking is usually available, and if not given this opportunity to work many of these persons would be unable to find other employment. The possible universal use of the mechanical cotton picker implies a social as well as an economic problem. When cotton is harvested by a machine, the hours of labor will be reduced so that the production of cotton will be comparable to the growing of corn and other row crops. This will tend to reduce the cost of production, but it will also reduce the number of persons required on southern farms.

Cotton picking in the major portion of the Cotton Belt usually starts in August; most of the work is done in September, October, and November; the task is not completed in some areas until about midwinter. Pickers are paid by the pound. The rate of pay varies with the section and the general economic condition, including the price of cotton. In a field of cotton that will yield one-half of a bale or more per acre, a good picker can average 200 pounds of seed cotton per day. Under less favorable conditions an average day's work will be about 100 pounds.

It is the practice in some sections to snap cotton by hand. This means that the pickers snap off the entire boll without removing the locks from the burs.



Growing and Harvesting Cotton

1. A cotton harvesting machine.
 2. Picking by hand.
 3. Cultivating cotton.
 4. Sledding cotton.
-



Snapping is a faster method of harvesting than picking. In Mississippi a study of both methods was made, and the results show that snapping in the early part of the season is 2.11 times as fast as picking; and in the last part of the season it is 3.91 times as fast.

It has been found in Mississippi, Oklahoma, and other States that snapping increases the dirt and trash included in the cotton, advances the cost of ginning, lowers the grade of cotton, and, at times, decreases the staple length classification.

A study to determine the relative economic advantage of the several methods of harvesting cotton in Oklahoma led to the following conclusions:

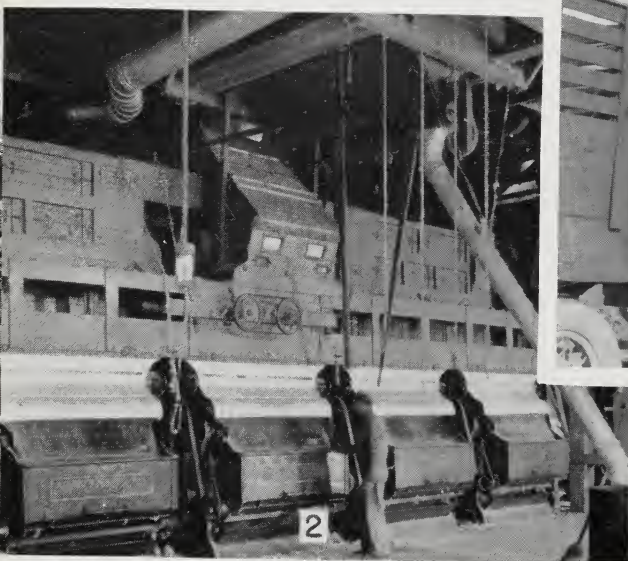
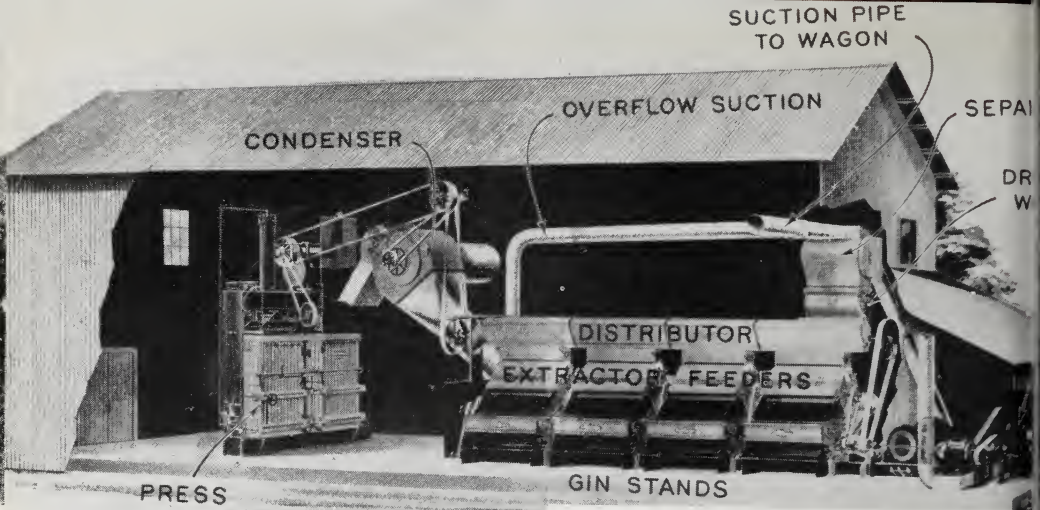
A higher price can be secured from cotton picked by hand, but there are disadvantages which may more than offset this added return. Cotton can be harvested more rapidly by snapping. Snapping enables a smaller labor force to harvest a given amount of cotton and get the work done with less danger of weather damage to the crop. This factor is especially important in western Oklahoma where the average amount of cotton per farm is relatively large. Other factors, which are relatively important, are the variety of cotton grown, the condition of the bolls when mature, the amount of rainfall during harvest, and the influence of gin managers who sometimes prefer to gin snapped cotton because of the higher ginning rate they are allowed to charge for it.

In Texas and Oklahoma, a method of harvesting known as stripping or sledding is practiced to a limited degree. This is a mechanical method. It is done with a sled or stripper which is pulled down the row. The fingers or rolls of the machine strip the bolls off the plant.

Stripping has the same advantages and disadvantages as snapping, the main difference being the added speed which is possible with this machine method. Strippers are made for one, two, and even four rows of cotton. The size is limited by the power available to pull the machine and the size of the fields in which the machine is used.

From research conducted by the Texas Agricultural Experiment Station, it has been learned under conditions of the study that 1,400 pounds of hand-picked cotton are required to make a 500-pound bale; that 2,100 pounds are required when the crop is snapped; and that 2,900 pounds of sledded cotton are required to produce one bale.

The cost of harvesting a bale by sledding, as determined by the Texas studies, was only \$2.55 as compared with \$15.75 for snapping, and \$21.00 for picking. This advantage is offset to some extent by the added costs of ginning. It cost \$14.50 to gin a bale of sledded cotton, while the cost of ginning a hand-picked bale was only \$5.60. The cost of ginning a snapped bale was \$10.50. A summary of this Texas experiment gives the following total costs of harvesting and ginning



Ginning Cotton

1. Diagrammatic sketch of gin machinery.
2. Interior of a modern gin.
3. Seed cotton for the gin.
4. Large-scale transportation equipment.

by the three methods: Picked cotton, \$26.60; snapped cotton, \$26.25; and sledded cotton, \$17.05.

The outstanding facts about sledding as a method of harvesting are: (1) A greatly reduced cost of gathering; (2) a greatly increased ginning cost; (3) a lower total cost; and (4) a lowering of the value of the lint.

POSSIBLE IMPROVEMENTS IN GINNING

The greatly reduced costs that are possible by using some mechanical means of harvesting cotton will probably bring about a change in cotton-producing methods regardless of whether or not a mechanical picking machine is used. In fact, there is every reason to believe that one of the changes that may come into the cotton-growing picture of the future will be improvements in ginning machinery and ginning operations which will make it possible to separate the lint from a very large amount of trash without seriously lowering the grade. When this is done, cotton picking by hand will be as obsolete as the cutting of grain with a cradle.

THE SOCIAL PROBLEM

Perhaps greater mechanization in growing cotton might have taken place some years ago if it were not for many limitations. Among these limitations are topographical and other physical handicaps in the Southeast, the lack of economical harvesting machinery to take care of the picking problem, and the abundance of labor on Southern farms.

The fact is that the whole economic and social structure of the Old South had been developed on the basis of the production of cotton by the use of the abundant supply of cheap labor, that is workers whose training had prepared them to grow cotton only. With so large a population that had no other employment and opportunities, and had other handicaps mentioned, there was little incentive on the part of growers to change the methods of production. Today there are many owners of large farms in the South who would use more farm machinery except for the fact that such a change would not permit them to retain workers who may have been on the farm for many years.

Thus there is the social as well as the economic problem involved in the way in which cotton is grown in the older sections of the Cotton Belt. But the trend in all production processes in the United States—both agricultural and industrial—has been toward the universal use of power and machinery. These are the servants which, together with our natural resources, make possible the wealth and prosperity of our Nation. If not used in cotton production, ultimately

those who grow the crop will be laboring under a handicap from which all other large classes of workers have been liberated.

METHODS IN COTTON PRODUCTION

While the mechanization of cotton production is passing through what might be considered the experimental stages of development, there are other methods by which production costs may be reduced or total income from the crop increased. Perhaps the most important of these methods are those through which larger yields per acre are obtained and grade and staple improved.

Larger yields per acre.—Up to a certain point, larger yields per acre of any crop are almost always associated with lower costs per unit.

As a result of facts learned from cost studies, agronomists and economists in the United States Department of Agriculture and in Southern land grant colleges have repeatedly pointed out that the highest acre yields of cotton are usually produced at lowest cost per pound. For example, while it cost 9 cents per pound to produce cotton by making a 500-pound bale on each acre in a given locality, it cost 22 cents a pound when the yield was between 101 and 140 pounds of lint per acre.

When the demand for cotton is limited in relation to the supply, a situation always resulting in a low price, it is necessary to produce cotton at the lowest possible cost. Also, especially in the eastern part of the Cotton Belt, the smallest possible number of acres should be devoted to cotton so that other acres of cropland will be available for growing food and feed crops, for soil-improvement uses, or for other cash crops. These conditions emphasize the necessity for making the largest possible yields per acre. There is no one way through which such an objective may be achieved. To make large yields per acre every single job involved in cotton growing must be done with the maximum of efficiency. Of the jobs, however, none is so important as that of controlling erosion and maintaining the fertility of the soil. It is also essential to control insect pests and diseases. Large yields per acre are never obtained without a good stand and an ample supply of plant food and moisture. These lessons are being learned well by the majority of producers, for some of our highest national acre yields have been recorded in recent years.

Improved grade and staple.—The increased competition from foreign-grown cotton makes it imperative that every possible effort be made to produce cotton efficiently in the United States. This means that growers must concern themselves with the improvement of grade and staple as well as with increased yields per acre.

Grade refers to the color, preparation, and amount of foreign material or trash cotton contains. It is largely influenced by weather



Applying more power in relation to man-labor

conditions before harvesting, the time and care in harvesting, the condition of the cotton at the time of ginning, the kind and condition of ginning equipment used, the method of its operation, and the care of the cotton after it is ginned.

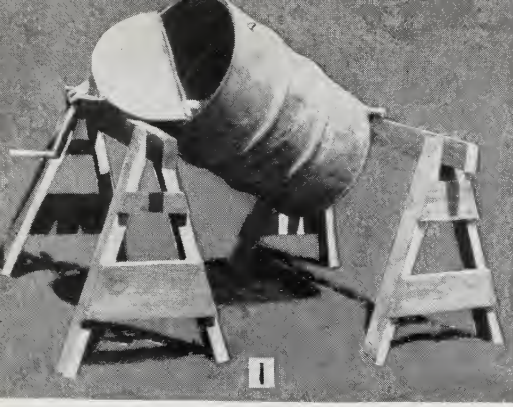
While the weather conditions prior to and during harvest time are beyond control of farmers, low grades can be prevented to some extent by early and careful picking; by taking care that cotton is not damp at the time of ginning; by using only the best ginning equipment, properly operated; and by the use of suitable bagging and storage facilities after it is ginned.

Staple is the cotton fiber; but staple, as the term is used in the cotton trade, refers to the length of the cotton fibers. The length of cotton fibers is a hereditary characteristic, but is influenced somewhat by the weather conditions, the fertility of the soil, and other conditions. In other words, cotton of a certain variety normally produces a staple of known length, but if grown on fertile soil with ample moisture the fibers will tend to be longer than if grown on poor land in a dry season.

The staple length desired by any one cotton mill will be determined to a large extent by the kind and type of product which is being made, but in general, the longer staples are preferable, and in extra strong and in extra fine yarns they are essential. The staple length of United States cotton has shown substantial improvement in the past decade from an average of about $1\frac{5}{16}$ -inch to approximately 1 inch.

Improving Production Methods

1. Drum for treating seed.
 2. Plowing under a cover crop.
 3. Dusting cotton.
 4. Cotton bagging.
 5. One-variety gin.
 6. United States Cotton Laboratory, Stoneville, Miss.
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Character is an element of cotton quality. The chief purpose of character classification is to give an appraisal of different cottons for marketing and manufacturing purposes. Not all cottons having the same grade and staple produce equally satisfactory yarns. The reason for this difference is ascribed to what is called character. Character factors are important because, for instance, a cotton classer adjusts grade and staple designations by impressions received from character factors. Some character factors are susceptible to measurements such as uniformity, strength, fiber fineness, and cell wall thickness. Other character factors such as elasticity, pliability, and frictional property cannot yet be measured adequately. There are still other character factors such as fiber porosity and fiber durability that cannot be measured at all.

Controlling the boll weevil.—

The boll weevil was for a number of years a serious menace to American cotton. In order to reduce weevil damage, growers sought an early maturing cotton. The early maturing varieties in most cases had shorter fibers. However, growers are learning how to control the weevil more effectively by other means, and attention is being given once more to improving staple length. Progress in recent years has been made in all parts of the Cotton Belt.



Boll weevil (magnified)

Community production.—The One-Variety Cotton Community plan has been the most effective means of bringing about the desired improvement in staple.

To carry out such a plan, the farmers of one community agree upon one variety of cotton which they will grow. They secure the best seed of a thoroughly tested variety from the breeder or from some other reliable source, and then keep the variety pure. Such a program has many advantages, only a few of which can be listed here. It results in choosing a variety adapted to local conditions; it stimulates interest in the best possible methods of production; it prevents the mixing of varieties, and consequently of staple lengths; it results in a more uniform staple length for the community, which attracts buyers.

On April 13, 1937, a Federal act was passed which provides for the official classing of cotton from communities organized for the improvement of their product.

This act should encourage the growing of better quality cotton and the formation of more one-variety communities, since it is necessary for a community to be organized to obtain this classing service. Farmers taking advantage of the provisions of this act will be in a better position to demand and get a premium for quality cotton.

All of the problems in cotton growing which have been presented here have as their objectives either decreasing the cost of production or improving the quality of our cotton. These problems will engage the attention of cotton growers for many years to come.

SUMMARY

1. Cotton is a crop which requires more hours of labor per acre than any other field crop generally grown in the South except tobacco.
2. Chopping and picking are jobs which require the largest number of hours of human labor. The job of chopping may be eventually eliminated from cotton growing.
3. New ways of harvesting cotton are being developed and these newer ways reduce the number of hours of human labor, but the grade of cotton is lowered because of the imperfect harvesting and the lack of perfect cleaning equipment.
4. The next great change that may come in cotton production is improved cleaning and ginning so that the more rapid methods of harvesting may be utilized without lowering the value or desirability of the product.
5. The South has never used as much modern farm machinery as other parts of the country largely because (1) there was such an abundance of cheap farm labor; (2) the whole social and economic structure of the Old South was based on the production of cotton by cheap labor; (3) the laborers had learned no means of making a living except by growing cotton; (4) the physical limitations, such as topography; and (5) lack of economical harvesting machinery to take care of the picking problem makes the adoption of modern machinery less of a certainty than in other parts of the country. These factors have handicapped the South, as compared to the North and West, in developing other sources of farm income. Therefore, there was little or no incentive to make changes in the

established methods of farming. So long as such a condition prevails the income of the farm labor group in the Cotton Belt will be low because of the limited production of any one worker. And unless employers pay low wages, they will find it advantageous to use more labor-saving machinery, with consequent unemployment in farm labor groups.

6. The use of the mechanical cotton picker on a universal scale, or any other general mechanization of cotton production, will throw out of employment many persons now living on farms in the Cotton Belt.
7. Individual farmers may increase returns from cotton by increasing the production per acre.
8. Individual farmers may increase the value per pound of their cotton by improving the grade and staple.
9. The One-Variety Cotton Community plan is an effective means of improving the staple of cotton grown in the United States.

DO YOU KNOW: How growers market cotton? What the basis is for the price of any one bale? What market facilities are provided for buying and selling cotton? What the terms mean that are used in cotton price quotations? What functions are performed by cotton exchanges? What are the relations of grade and staple to price? How the standards and grades are established? What the average price of cotton has been in a period of years?

HOW COTTON IS SOLD

Cotton may be sold on any business day of the year. Growers usually sell to a local buyer, or through their own cooperative marketing association. There are local buyers in practically every trading center in the Cotton Belt. Each of the major cotton-producing States has a growers' cooperative marketing association.

If a farmer decides not to sell his cotton immediately after ginning, he may store it and borrow money on it. Cotton in approved warehouses, which are readily available to all growers, may be used as collateral for a loan. Cotton thus stored is like having money in the bank.

Since cotton is one of the most important commercial commodities of the world, a complete marketing system for it has been developed which extends to the remote parts of the world. Exchanges have been established in the United States and other countries.

The local buyer in any locality takes a number of factors into consideration in the price offered for a particular bale. The current price of spots and futures and the grade and staple of the cotton in the bale under consideration are the most important of these factors.

SPOT MARKETS

To understand the factors involved in the price of any particular bale of cotton, it is necessary to know something of the marketing facilities provided for cotton.

In the newspapers of the Cotton Belt, especially, there is given in each issue the price of spot cotton. This refers to the price of Middling cotton with a staple length of $1\frac{5}{16}$ -inch. It is the price recognized by the exchanges for the particular time given.

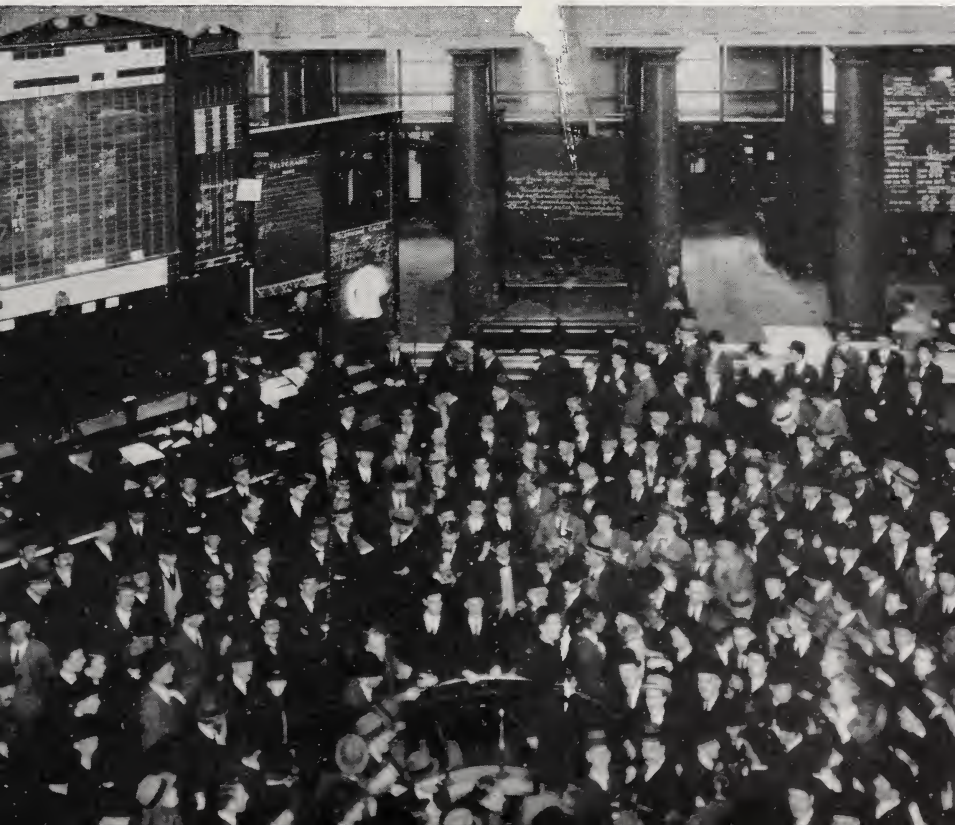
The term spot cotton was first applied to cotton actually in a warehouse, at a port, or on the spot at any market. As now used the term applies to all actual cotton bought and sold.

To aid in disseminating accurate information concerning prices for cotton, the United States Department of Agriculture has selected the following cities as designated spot-cotton markets—Norfolk, Augusta, Savannah, Montgomery, New Orleans, Memphis, Little Rock, Dallas, Houston, and Galveston. In each of these cities there is a quotations committee which makes a daily survey of the market and reports prices of the different grades of cotton in that market to the Department and to the cotton exchanges. Any market in which spot cotton is bought and sold, however, may be regarded as a spot market.

COTTON EXCHANGES

The local buyer in making an offer on a particular bale of cotton takes into consideration the prices paid for cotton on the leading spot markets. He also takes into account the prices of future contracts. Such future contracts are made by persons trading in cotton on the exchanges.

The cotton exchange at Liverpool



There are three cotton-futures exchanges in the United States. These are located at New Orleans, New York, and Chicago. A number of exchanges are located in other countries of the world, the most important being at Liverpool and Bombay.

During the War between the States cotton was very scarce and reached the highest prices on record.

About the same time that trading in futures developed in New York a similar practice was initiated in Liverpool. American cotton was loaded on ships in this country for delivery in Great Britain. But samples of these bales were placed on fast sailing vessels which reached Liverpool sooner than the cotton. Trading was conducted on the basis of the samples of cotton.

In 1866 through the use of the Atlantic cable, market reports from the United States were available in Liverpool daily. This stimulated the plan of selling cotton in advance of arrival. This required a system of grading and resulted in sales on the basis of quality, which is used today.

Very little was known about classing cotton until about 1909. At that time the United States Government initiated a plan toward standardization of cotton classing in this country. Continuous refinements have been made in cotton classing since 1909. Classing cotton requires great skill.

Out of these beginnings the present plan of dealing in future contracts developed. Under this plan any individual who cares to do so may buy cotton for delivery in any month for as much as a year in advance. Under the execution of these contracts cotton is not actually delivered in many instances. Buying or selling cotton in this way, however, is used by businessmen and corporations to protect themselves against loss from price fluctuations. Thus the exchanges not only aid in the marketing of cotton by making price quotations readily available but they act as a barometer in reflecting prices for several months in the future, and in such a way tend to stimulate and stabilize business.

COTTON CLASSING

To permit the operation of such a far-flung marketing system as is applied to cotton, so that every buyer and seller may understand the contract that is being made, it is necessary to have a clearly defined system which concerns itself with the minutest details of the quality of the cotton that is being bought and sold.

The basis for the price of a bale of cotton on any one day at a given market, aside from the factors already considered, is its grade, staple length, and the character of its fiber.

Grade is determined by a combination of foreign matter, color, and preparation. Staple refers to the length of the fibers. Character may be defined as those elements of cotton quality which are not included in the grade or staple length.

Foreign matter refers to the leaf trash, shale, seeds, motes, dirt, and sand that normally remain to some degree in the lint after ginning. There is more foreign matter in low grade cotton than in the higher grades.

Color in most American cotton is classified as White but there are standard descriptions for Spotted, Tinged, Yellow Stained, and Gray.

Preparation denotes the smoothness of the lint resulting from ginning and the extent to which the normal condition of the fibers is preserved. Roughness of preparation results from careless ginning or ginning of damp cotton, and reduces the grade of cotton materially.

Standards for grades of American cotton, including upland, American-Egyptian, and sea-island are prepared by the United States Department of Agriculture in consultation with the cotton classing experts from the cotton trade, cotton manufacturers, and exchanges in this country and in various foreign countries interested in the American cotton trade. Sample boxes containing these Universal Standards may be secured from the Department of Agriculture by anyone who cares to purchase them.

In any classification of cotton on the basis of staple, there can be as many groups as there are fiber lengths varying by $\frac{1}{32}$ inch. Do you realize how short $\frac{1}{32}$ inch is? The upright part of this figure 1 is nearly $\frac{1}{32}$ inch wide.

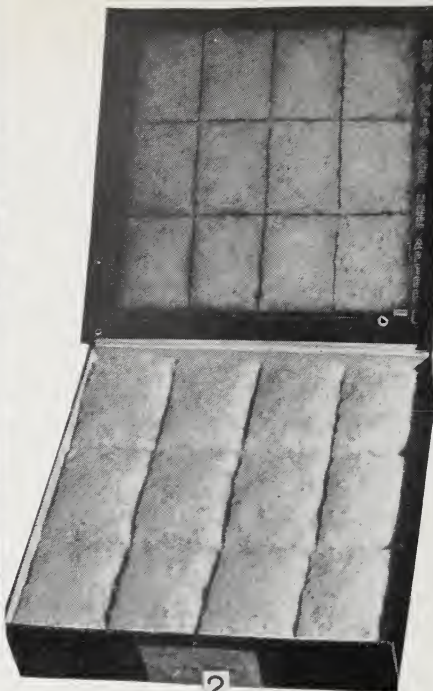
Character in cotton includes such features of quality as strength, body, uniformity of fiber, silkiness or fineness, and drag. Drag is the term used to indicate the resistance offered by fibers in being pulled apart.

A consideration of grade, staple length, and character of the fiber enters into the determination of the price of a given bale. The determination of these qualities is termed cotton classing.

BASE FOR COTTON PRICES

Middling grade with a staple length of $\frac{15}{16}$ -inch is now the base for cotton prices. Until August 15, 1939, Middling $\frac{7}{8}$ -inch had served as the base for cotton prices.

The value of other cottons is expressed as so many points "on" or "off" Middling $\frac{15}{16}$ -inch. A point is one-hundredth of a cent. "On" means above the price of the base; "off" means below the price of the base. Thus, 100 points "on" means 1 cent above Middling $\frac{15}{16}$ -inch; 75 points "off" means $\frac{3}{4}$ of a cent below the price of Middling $\frac{15}{16}$ -inch cotton.



DATE DEC. 9, 1956				
FUTURES	OCT.	DEC.	MAR.	MAY
PREVIOUS CLOSE	12-35	12-11	11-97	
TODAY'S MARKET OPENING	—	12-42	12-17	12-06
HIGH	—	12-51	12-24	12-10
LOW	—	12-42	12-17	12-05
PRESENT	—	12-49	12-24	12-08
GOVERNMENT CROP ESTIMATE	12,407,000			
GINNING REPORT	11,494,000			



Marketing Cotton

1. Classing cotton.
2. Middling cotton.
3. Lengths of staple.
4. A quotation board.
5. New Orleans exchange.
6. Newspaper quotations.

**STAPLE.
(REDUCED)**

$\frac{3}{4}$

$\frac{7}{8}$

$\frac{15}{16}$

1

$1\frac{1}{16}$

$1\frac{1}{8}$

$1\frac{3}{16}$

$1\frac{1}{4}$

3

U. S. D. A

FRIDAY'S CLOSE at NEW ORLEANS

New Orleans spots steady
Middling 9.22
New Orleans futures closed steady

	Old	New
December	9.22	9.32
January	9.14	9.24
March	9.05	9.15
May	8.94	9.07
July	8.77	8.91

The market closed steady with a slight upward tendency on the latter months. The net gains for the week were 1 point on Dec.; 2 on Jan.; 3 on March; 2 May, and 3 on July.

6

How does this system apply to the price of a pound of cotton?

The following example will illustrate the application of points—"on" and "off"—as they apply to the price of cotton: On a certain day the price of Middling $1\frac{5}{16}$ -inch was 8.15 cents per pound on a given spot market. On that same day in the same market, Good Middling, 1 inch, was quoted at 135 points on, whereas Good Ordinary $1\frac{3}{16}$ -inch, was quoted at 390 points off. By adding the two quotations, 135 and 390, it is found that there is a difference of 525 points, or 5.25 cents per pound between the quotations of these two cottons.

How are the facts of grade and staple that have been given, used in determining the price of a bale of cotton?

On the market day for which the previous figures were given, a 500-pound bale of Middling $1\frac{5}{16}$ -inch cotton sold for 8.15 cents per pound, or a total of \$40.75. A bale of the same grade, but with a staple length of $1\frac{3}{16}$ -inch sold "off" 100 points, which means that it sold for 7.15 cents per pound, or \$35.75. A bale with a staple length of 1 inch sold "on" 65 points, and brought a price of 8.80 cents per pound, or \$44.00. Thus it is seen that a difference in staple, from $1\frac{3}{16}$ to 1 inch, made a difference of almost \$10 a bale. But on the same day a bale of Low Middling Tinged, staple $1\frac{3}{16}$ -inch, sold "off" 410 points and brought the seller \$20.25. These prices indicate the importance of grade and staple.

Every possible effort should be made to produce the quality of cotton that will net the producer the largest profit. The points "on" and "off" the base indicate the relative value of these cottons from the standpoint of the purchaser. The points vary from time to time depending on the supply and demand of the various qualities. Farmers will profit from a study of market quotations by learning more of the qualities and characteristics for which spinners are willing to pay. For many years there has been an urgent demand for cottons with a longer staple length. It is possible that if all growers, or a large percentage of them, should turn to the longer staple cottons that the supply would exceed the demand. In this case the points "on" for the longer staples would decline, or even cease to exist. But there will never come a time when a good grade of cotton is not to be desired. It will always command a premium over cottons less desirable.

Experience has indicated that it is desirable for the farmers of one community to grow one variety of cotton. There are a number of advantages to be gained from this practice, but one of the most important is that of marketing. The United States Department of Agriculture, under stipulated conditions, will make available to such communities free cotton classing service. This service will enable growers to know exactly what grade and staple of cotton they

are producing, and will assist them in informing themselves relative to the qualities for which there is the greatest market demand.

COTTON PRICE FLUCTUATIONS

Over a period of years cotton prices have fluctuated widely.

At the beginning of the War between the States, the average price of spot cotton per pound at New York was 13 cents. It continued to rise during the war until a peak of \$1.78 a pound was reached at the same market for the month of August 1864.

Between 1920-21 and 1929-30, the average annual price received by farmers was never less than 12 cents a pound with a peak of 28.7 cents in 1923-24. For a period of 3 years beginning in 1930, the annual average prices were below 10 cents, averaging only 5.9 cents in the season 1931-32.

Fluctuations in the price of cotton are unfortunate for those who depend upon the crop for a living. It would be better in the long run to have prices fixed at a relatively low level than to have them change so greatly from year to year. Since the price of cotton depends to a great extent upon supply in relation to demand, one of the most effective means of stabilizing the price is that of never producing an amount that would result in an excessive supply.

SUMMARY

1. Farmers may sell cotton on any business day in the year to local buyers. They may sell through a growers' cooperative marketing association, or they may hold their cotton and secure a loan on it if placed in an approved warehouse, where it can be insured.
2. The term "spot cotton" applies to all cotton bought and sold, except on future contracts.
3. There are cotton exchanges located at New Orleans, New York, and Chicago.
4. Grade and staple and character are important in determining the price of a bale of cotton at any given time. Making determinations of these qualities is called classing. Grade is based upon color, foreign matter, and preparation. Staple refers to the length of the cotton fibers. Character deals with all aspects of quality not included in grade and staple.
5. Standards for grades of cotton and types for staple length are prepared by the United States Department of Agriculture.

6. Middling grade of $\frac{15}{16}$ -inch staple is the base for cotton prices. All others are usually priced at points "on" or "off" Middling $\frac{15}{16}$ -inch. A point is one-hundredth of a cent per pound.
7. Over a period of years cotton prices have fluctuated widely, which is unfortunate from the standpoint of those persons who depend upon it for a living.

DO YOU KNOW: *How much of the cotton grown in the United States is sold to foreign countries? Why these foreign countries do not buy as much cotton as in former years? How foreign trade is maintained? What the losses in foreign markets mean to the cotton farmers of the United States? What programs and policies of the Federal Government deal with cotton marketing and other adjustment problems? How to deal with the problems resulting from changing demands?*

CHANGES IN OUR COTTON TRADE

Changes are constantly taking place throughout the world. During the years that have elapsed since Eli Whitney invented the cotton gin, governments have been created and destroyed, populations have been increased and shifted, and the ways in which many people of the world make a living have been revolutionized. Nothing is quite the same today as in the earlier periods of our existence as a nation.

All these changes have in some way, great or small, influenced the position of the United States among the nations of the world. And these changes have affected the lives and incomes of those American citizens engaged in producing, processing, and handling cotton.

During the early years of cotton growing in the United States, the producers did not wait anxiously for the reports which would indicate the size of the crop to be sold. Of course no such service was available. But competition was not so keen then as it is today. The United States was supplying the major portion of the cotton required by the newly established cotton textile industry of Great Britain. Under what appeared to be favorable conditions for increased consumption, the South expanded cotton growing as rapidly as possible.

But conditions have changed with the years. Many cotton-producing countries now have modern cotton textile mills within their borders. Today more than 60 nations of the world are engaged in growing cotton. In contrast with conditions which existed during the lives of our forefathers, the major problem of the cotton growers of the present generation is that of selling the cotton which may now be grown so abundantly. Cotton is produced for sale; it is a cash crop.

OUTLETS FOR COTTON

There are two outlets for cotton grown in the United States—the home market and the markets in foreign lands.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
WASHINGTON, D. C.

Release:-
October 9, 1939,
11:00 A.M. (E.T.)

COTTON REPORT AS OF OCTOBER 1, 1939

The Crop Reporting Board of the Agricultural Marketing Service makes the following report from data furnished by crop correspondents, field statisticians, and cooperating State agencies. The final outturn of cotton will depend upon whether the various influences affecting the crop during the remainder of the season are more or less favorable than usual.

STATE	ACREAGE FOR HARVEST 1939 (PPELIM.) Thous. acres	OCT. 1 CONDITION				YIELD PER ACRE				PRODUCTION (Ginnings) ¹ 500 lb. gross wt. bales		
		Aver- age		Aver- age		Indi- cated		Aver- age		1938	1939 Crop	1939 Crop Indicated Oct. 1
		1938	1938	1938	1938	1938	1938	1938	1938	1938	1938	1938
		37	37	37	37	37	37	37	37	37	37	37
		Pct.	Pct.	Pct.	Pct.	Lb.	Lb.	Lb.	Lb.	Thous. bales	Thous. bales	Thous. bales
Missouri.....	372	68	84	88	313	450	463	252	336	260		
Virginia.....	35	68	53	43	284	149	164	40	12	12		
N. Carolina.....	777	67	54	66	281	216	292	702	383	475		
S. Carolina.....	1,245	61	58	82	243	249	350	827	648	910		
Georgia.....	2,008	63	56	68	212	203	232	1,192	852	976		
Florida.....	72	69	68	40	144	163	80	34	26	12		
Tennessee.....	723	64	74	67	238	320	298	466	490	450		
Alabama.....	2,074	64	69	55	205	251	197	1,203	1,081	855		
Mississippi.....	2,529	64	69	65	225	322	305	1,596	1,704	1,612		
Arkansas.....	2,153	59	73	74	212	304	307	1,273	1,349	1,380		
Louisiana.....	1,133	61	72	81	214	289	320	711	676	757		
Oklahoma.....	1,806	50	62	57	133	163	134	876	563	565		
Texas.....	8,666	60	63	62	147	168	160	4,077	3,086	2,900		
New Mexico.....	97	84	81	82	406	489	480	98	96	97		
Arizona.....	179	86	90	95	371	462	495	149	196	185		
California.....	331	88	89	94	491	596	616	290	424	426		
All other.....	22	72	77	80	275	379	354	14	16	16		
UNITED STATES.....	24,222	61	66	68	190.8	235.8	235.7	13,800	11,943	11,923		
Sea Island.....	18.7	—	55	51	—	54	66	—	3.4	2.6		
Amer. Egyptian.....	40	* 90	87	94	230	234	263	18	21	22		
Lower Calif. (Old Mexico).....	102	86	88	79	217	172	188	46	34	40		

* Allowances made for interstate movement of seed cotton for ginning.

2 Included in State and United States Totals. Grown principally in Georgia and Florida with small acreages in S. C., Ala., Miss., Ark., La., and Tex.

3 Included in Arizona and United States Totals. * Short-time average

4 NOT included in California figures, NOR in United States total

APPROVED:

Hawallea
SECRETARY OF AGRICULTURE.

Crop Reporting Board:
R. F. Callander, Chairman.
L. H. Wiland, Secretary.
Joseph A. Becker, H. H. Scrutz,
F. H. Whitaker, Stuart L. Bryan,
Henry M. Taylor, Fred Daniels.





Transporting cotton by inland waterways

Since 1920 there has been little change in the quantity of cotton consumed in the United States. When business is good, consumption increases; in periods of depression, it declines. There will probably be some additional consumption as the population increases. The discovery and the development of new uses for cotton seem to hold great possibilities for a permanent increase in domestic consumption.

One significant possibility for increased domestic consumption, which has been given little consideration, is to be found among those persons now having very low income. The use of cotton goods in this country is less than it should be because many families are not able to buy a sufficient quantity to meet their needs adequately. It has been calculated that if the more than 23,000,000 families in the United States getting less than \$2,000 a year spent as much for cotton goods as those getting between \$2,000 and \$3,000 a year, we would have a home outlet for an additional 1,500,000 or 2,000,000 bales of cotton.

However, it has been the sale of cotton to foreign lands that has made it possible for the United States to maintain more cotton farms than those of any other type, and to hold the leading place among the cotton-producing nations. For many years about 60 percent of the Nation's crop was produced for the export market. To a greater extent than any other large group of American citizens, the cotton farmers of the Nation have depended upon foreign markets for a livelihood.

DECLINE IN FOREIGN TRADE

In recent years world conditions have been unfavorable for the sale to other countries of commodities produced in the United States.

In 1927 total domestic exports from the United States had a value of \$4,773,000,000. Of this sum, \$1,815,000,000 represented the value of

agricultural products sold to foreign countries. Cotton accounted for 45 percent of the agricultural exports and 17 percent of the total exports.

Ten years later, in 1937, the total domestic exports amounted to \$3,362,000,000, and of this smaller sum agricultural products accounted for only \$891,000,000. In 1937 cotton represented 34 percent of the agricultural exports and only 9 percent of the total exports.

These figures show (1) that the total exports of American products declined during the 10-year period; (2) that the decline in agricultural commodities was greater than the decline in other American products; and (3) that cotton, during the period, lost 24 percent with respect to agricultural products and 47 percent in the place occupied in our total exports.

WHY COTTON EXPORTS DECLINED

What accounts for the marked decline in foreign outlets for cotton grown in the United States?

Two reasons, perhaps to a greater extent than all others combined, account for the decline in foreign outlets for American cotton. These are increased cotton production in other lands, and the

American cotton for export



unwillingness of the people of the United States to accept goods from other countries in exchange for our own products.

In the study of cotton in foreign lands, the reader learned how cotton production and processing have been developing and expanding in many countries for a long period of years. It is obvious that these countries, and those with which they trade, are no longer so dependent upon the United States for raw cotton or for cotton goods as in former years. Since about 90 percent of the agricultural and industrial products of the United States are normally consumed by our own citizens, the majority of our people are not directly dependent upon foreign trade. They do not realize that to sell goods to other countries, it is necessary for this country to accept goods in exchange.

FOREIGN TRADE IS AN EXCHANGE

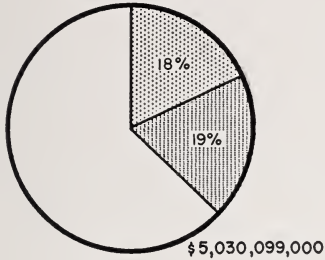
It cannot be emphasized too strongly that foreign trade, just as the expression implies, is largely an exchange of goods. One country has something that another wants or can use, a second has a surplus or abundance of something else not produced adequately in the first, so an exchange is made. As an example, Brazil has an abundance of coffee. No coffee is produced in the United States. But in the United States there are superior farm implements manufactured which are not made in Brazil. An exchange is made. Both Nations are benefited. This is the essence of foreign trade. It is desirable for many reasons including the fact that each country has economic advantages in the production of certain products. We can make automobiles, for example, at a lower cost than Brazil, but we cannot grow coffee so economically.

A study of the exports and imports of the United States over a period of years will reveal a very close relationship between exports and imports. When imports increase, exports become correspondingly larger; when imports decline, exports are reduced. In 1925 the exports of the United States, for example, had a total value of \$5,283,000,000 and in the same year products valued at \$4,464,000,000 were imported. In 1933 when exports amounted to \$2,042,000,000 the products imported were worth \$1,721,000,000. The relationship shown in these figures is typical of any normal period that may be considered. In order to sell goods to other countries, this Nation must in turn buy goods from them.

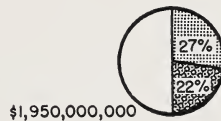
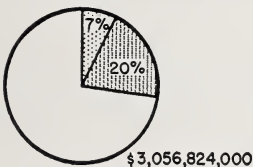
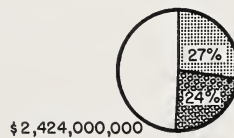
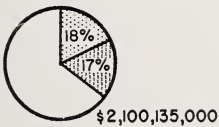
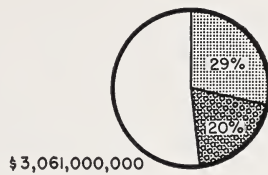
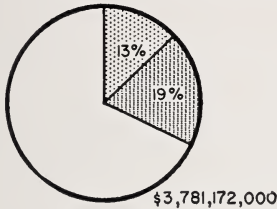
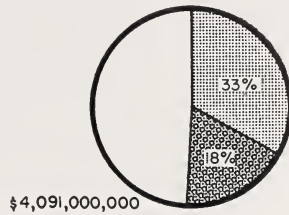
In theory the majority of the citizens of the United States wish to see the foreign trade of this Nation increased. But the practical difficulty involved is that this country is so nearly self-contained, so far as the necessities of life are concerned, that it is difficult to agree upon products which will be acceptable in exchange for our own. Our sale of raw cotton to Japan affords an excellent example

VALUE OF TOTAL UNITED STATES EXPORTS AND IMPORTS BY ALTERNATE YEARS 1928-38

EXPORTS



IMPORTS



- VALUE OF NON-AGRICULTURAL EXPORTS OR IMPORTS
- VALUE OF COTTON EXPORTS
- VALUE OF OTHER AGRICULTURAL EXPORTS
- VALUE OF LEADING AGRICULTURAL IMPORTS
- VALUE OF OTHER AGRICULTURAL IMPORTS

of such a situation. In recent years, Japan purchased annually at least 1,000,000 bales of American cotton. Textiles made from cotton were shipped to the United States. But it was believed that such importations reduced the demand for textile products made in our own country, hence they were not acceptable to the people of the United States. Japan, on the other hand, found that it was possible to secure increased quantities of raw cotton from India and Brazil, and pay for it with goods made by the Japanese.

An analysis of the foreign trade of any country reveals that it is based largely upon an exchange of goods and services.

The people of the United States must either accept the goods of other nations to the extent to which they sell agricultural commodities and industrial products abroad, or be prepared to reduce domestic production to the requirements of the people living in this country.

COTTON TRADE AND COTTON FARMING

Largely because of the loss in foreign trade, 10,000,000 acres of cropland were withdrawn from cotton production. This meant that the people who produced cotton on this land, had, in reality, lost to a considerable extent the opportunity to work at the kind of farming with which they were most familiar. They were unemployed, so far as their former work was concerned, to the same extent as if they had been employed in factories that had closed their doors.

There is, however, one important difference.

In an industrial or commercial situation those who lose their jobs can be identified, but in farming this is not possible. All persons engaged in producing a commodity are affected in any changed agricultural situation. This means, in the case of cotton, that all who grew it were faced with the possible necessity of changing, in some measure, their farming operations because of the decreased market outlets for the crop.

Fortunately, it was possible to use the 10,000,000 acres withdrawn from cotton production for soil-building purposes and for growing food and feed crops. Those persons living on this land and the other cotton farms in the South have found new farm work in producing these products which contribute to a better standard of living. The changes which resulted also permitted desirable farm practices which had long been recommended, but which it had not been possible to institute without some incentive and financial assistance.

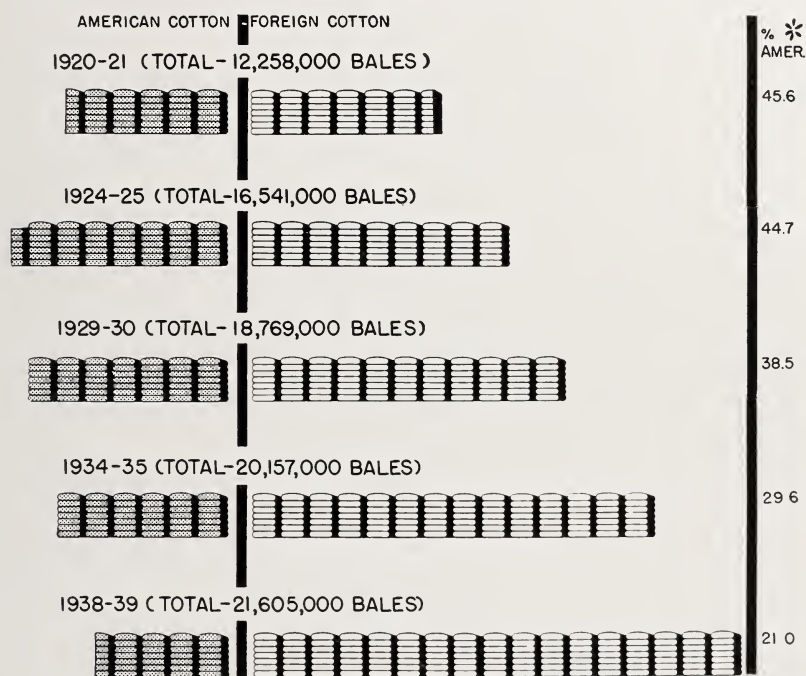
NATIONAL PROGRAMS AND POLICIES

The legislative and administrative officials and representatives of the Federal Government are aware of the seriousness of the situa-

tion resulting from the loss of foreign trade. Steps have been taken to make every possible effort to regain these lost markets and to help those farmers who formerly supplied these markets to bring about such adjustments in their farming operations as are necessary in the light of existing conditions. Many important legislative acts are devoted to the attainment of these objectives. Since changes both at home and abroad do not take place so rapidly, national programs and policies must also change from time to time.

In order that these programs and policies may be wisely formulated and efficiently executed, it is necessary in a democratic society that the citizens whose lives are affected by such legislation be fully and completely informed concerning all aspects of the problems involved. In fact, the programs dealing with the cotton situation do not, for the most part, become operative except through the will and action of individual farmers. This makes it a duty of every citizen to become informed concerning the programs and

MILL CONSUMPTION OF COTTON IN FOREIGN COUNTRIES BY SPECIFIED YEARS



policies which will lead to the best possible standard of living for cotton farmers and other citizens of the United States.

OUTLOOK FOR COTTON

In the light of the world situation and the programs and policies of the National Government, what is the long-time outlook for cotton in the United States? Can foreign markets be regained? Can per capita consumption at home be increased?

These are vital questions. Upon the answers to them rest the farm and economic structure of the South, and to a lesser degree that of the Nation as a whole. Unfortunately, the future can be forecast only in the light of past experiences and present trends. For these reasons it is difficult to be entirely certain as to conditions that will exist in the years that lie ahead. Factors, now unknown, may become a part of the picture.

There exists in the world today what might be described as a saturated cotton market. This means that the market will not "take up" at even the low prices of the 1930's any more cotton than is being purchased.

The saturated condition of the world's cotton market may be illustrated by comparing it with the quantity of salt that may be dissolved in a given quantity of water. If a pinch of salt is dropped into a glass of water, the salt will be dissolved. If a little more salt is added, it, too, will pass into solution. But if more and more salt is added a condition will be created under which no more salt will dissolve. There exists under such a condition what is known as a saturated solution. This law of science applies aptly to any market situation. And, in the case of cotton, any carry-over in excess of normal requirements may be thought of as the salt which will not pass into solution in a glass of water. Of course, the conditions may be changed. More salt will be dissolved if fresh water is added to that in the container or if the temperature is raised. More of any commodity may be sold if customers are added to the number previously available or if the incomes of the customers are increased or

United States Department of Agriculture regional laboratory, New Orleans, La.



COTTON EXPORTS FROM SPECIFIED COUNTRIES 1933-37

(UNITED STATES IN 500-POUND BALES—OTHER COUNTRIES IN 478-POUND BALES)

UNITED STATES



INDIA



EGYPT



BRAZIL



PERU



UGANDA



ANGLO-EGYPTIAN SUDAN



CHINA



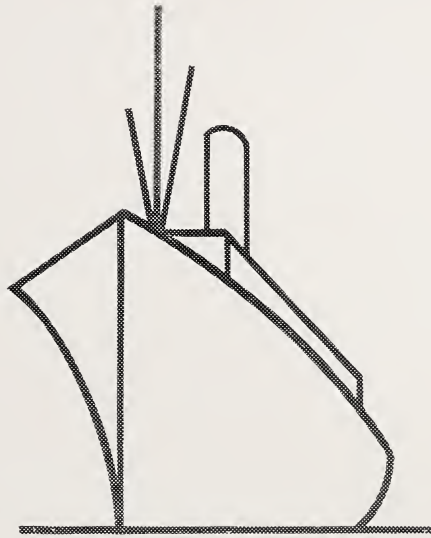
BELGIAN CONGO



IRAN (PERSIA)



SOVIET UNION



EACH SYMBOL REPRESENTS 200,000 BALES OF COTTON

prices are reduced. Perhaps the conditions limiting the sale of cotton may be changed so that larger quantities may be sold, but until such additional outlets are available the United States will not be able to use all of its cotton-producing facilities profitably.

One future possibility is that new uses will be discovered for cotton, both lint and seed. For several years the United States Department of Agriculture has been exploring such possibilities. While some new and practical uses have been developed, as yet they have not created a greatly enlarged demand. Now, a great Regional Farm Laboratory has been established by the United States Department of Agriculture which will be largely devoted to this task. The Cotton Textile Institute, created and supported by industry, has been at work, along with other private agencies, in an effort to create new outlets. From all these researches, public and private, it is hoped that new outlets for the cotton grown in the United States will be found so that remunerative employment may be provided for the land and labor of the Cotton Belt and for the millions of workers who depend directly or indirectly upon cotton for a living.

What future developments are to take place in the world cotton situation remain to be seen. In our journey, 'Round the World With Cotton, which encompassed many centuries and many lands, we have learned that cotton is an important commodity in the lives of people everywhere. Millions of Americans depend upon it for a living. And so long as this is true, we will continue to be interested in the story of cotton at home and abroad.

SUMMARY

1. Many changes have taken place in the world during the past 100 years, which have been favorable and unfavorable with respect to the position of the United States in the world's cotton trade.
2. Sales of cotton grown in the United States since 1920 have remained fairly constant, but sales to other countries have declined.
3. All exports have declined, but agricultural commodities to a greater extent than industrial products.
4. Foreign trade is largely an exchange of goods. The United States has many products to sell, but few are acceptable in return.
5. Many programs and policies of the Federal Government are in force for the purpose of stimulating foreign trade and

aiding cotton farmers. These programs must be changed from time to time to meet the requirements of changing conditions.

6. There exists in the world what might be called a saturated cotton market; that is, there is being produced as much as can be sold.
7. It is impossible to predict the future cotton requirements of the world or the quantity of cotton grown in this country which can be sold at home and abroad.

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